DEFENSE INFORMATION SYSTEMS AGENCY

JOINT INTEROPERABILITY TEST COMMAND
FORT HUACHUCA, ARIZONA

MIL-STD-188-182/ MIL-STD-188-182A CONFORMANCE TEST PROCEDURE

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MIL-STD-188-182/
MIL-STD-188-182A
CONFORMANCE
TEST PROCEDURE

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EXECUTIVE SUMMARY

Ultra High Frequency (UHF) Satellite Communications (SATCOM) provides military users with a long-haul data and voice communications capability. The demand for this service greatly exceeds the capacity of the system in its current single network per satellite channel mode. In an effort to provide the UHF capability to all users, the Chairman, Joint Chiefs of Staff Instruction (CJCSI) 6251.01 has directed that all terminals operating over non-processed UHF SATCOM transponders will be capable of employing Demand Assigned Multiple Access (DAMA) waveforms unless a waiver is granted. Therefore, DAMA Satellite Terminals which operate in the 5-kHz UHF range are required to conform to Military Standard (MIL-STD) 188-182. Military Standard 188-182 has been superseded by MIL-STD-188-182A.

This plan provides the test procedures to determine the extent to which UHF SATCOM terminals comply with MIL-STD-188-182A or MIL-STD-188-182 as appropriate. These test procedures utilize the 5-kHz Network Control System to provide channel control and to verify operation of the DAMA terminal under test.

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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

Paragraph **Page**

APPENDICES

LIST OF FIGURES

LIST OF TABLES

SECTION I - INTRODUCTION

I-1 BACKGROUND. Ultra High Frequency (UHF) Satellite Communications (SATCOM) provides military users with a long-haul data and voice communications capability. The demand for this service greatly exceeds the capacity of the system in its current single network per satellite channel mode. In an effort to provide the UHF capability for all users, the Joint Chiefs of Staff (JCS) have directed (through CJCSI 6251.01) that all terminals operating over non-processed UHF satellite transponders will be capable of employing Demand Assigned Multiple Access (DAMA) waveforms unless a waiver is granted. Therefore, DAMA Satellite Terminals which operate in the 5 kilohertz (5-kHz) UHF range are required to conform to Military Standard (MIL-STD) 188-182. Military Standard 188-182 has been superseded by MIL-STD-188-182A.

This plan provides the test procedures to determine the extent to which UHF SATCOM terminals comply with MIL-STD-188-182A or MIL-STD-188-182 as appropriate. These test procedures utilize the 5-kHz Network Control System (NCS) to provide channel control and to verify operation of the DAMA terminal under test.

I-2 PURPOSE. To determine if the terminal being tested meets the interoperability requirements specified in MIL-STD-188-182A, or MIL-STD-188-182, as appropriate.

I-3 SCOPE

I-3.1 Overview. This plan consists of twenty-three subtests which determine the compliance with MIL-STD-188-182A or MIL-STD-188-182 for satellite terminals utilizing 5-kHz UHF DAMA satellite channels. Appendix C contains the detailed requirements which are cross-referenced between both MIL-STDs. Regression testing will be performed if hardware/software changes are made to the terminals during testing. The test is categorized as a formal compliance test which will be conducted in a laboratory environment and over-the-air at the Joint Interoperability Test Command (JITC), Fort Huachuca, Arizona. Test duration is approximately three weeks, assuming minimal re-tests are required.

I-3.2 Resources. JITC government and contractor personnel will be utilized for the test. The major component required for this test is the Air Force NCS. Commercial-off-the-shelf test equipment will be used in conjunction with the NCS in the conduct of the test. Appendix B provides a detailed list of these and other test resources required. The sponsor of the terminal is responsible for supplying two terminals with associated manuals, interface cables, and power supplies.

I-3.3 Limitations. The following requirements of the MIL-STDs cannot be tested.

a. MIL-STD-188-182 Requirement 231, paragraph 5.4.4.1(2), "The modulation used shall have spectral containment equal to or better than constant envelope Shaped Offset Quadrature Phase Shift Keying (SOQPSK)." The pass/fail criteria for this requirement is not well defined. This is a spectral containment

requirement, which is indirectly verified by the terminal meeting the MIL-STD Adjacent Channel Emissions (ACE) requirements.

b. MIL-STD-188-182 Requirement 232, paragraph 5.4.4.1c, "The spectral shaping used during modulation, including additive noise, shall introduce no greater than a 1.0 decibel (dB) degradation in a receiver's performance, if the receiver uses matched-filter demodulation and expects the incoming signal to have 50 percent sinusoidally shaped modulation, as illustrated in Figure 11." A characterized, matched-filter demodulator which expects and is optimally tuned to receive a 50 percent sinusoidally shaped, modulated signal is not available to perform this test.

c. MIL-STD-188-182A Requirement 238, paragraph 5.4.4.4, "The terminal's modulated output, including additive noise, shall introduce no greater than 0.2 dB degradation in a receiver's performance, if the receiver uses matched-filter demodulation and expects the incoming signal to have 50 percent sinusoidally shaped modulation, as illustrated in Figure 12." A characterized, matched-filter demodulator which expects and is optimally tuned to receive a 50 percent sinusoidally shaped, modulated signal is not available to perform this test.

d. MIL-STD-188-182A Requirement 291 and MIL-STD-188-182 Requirement 237, paragraph 5.5.1(3), "Hardware implementation of the terminal shall include provisions for future implementation of Over the Air Rekeying (OTAR) for the orderwire." Operational orderwire OTAR has not been fully defined. Therefore, testing can not be performed and the requirement is considered not applicable.

SECTION II - DETAILS OF TEST

II-1 LOG-IN, REPORT STATUS, AND LOG-OUT

II-1.1 Objective. To determine if the terminal meets requirements related to accessing the network, reporting status, and leaving the network.

II-1.2 Criteria. Terminals compliant to MIL-STD 188-182A must meet requirements 7, 8, 16 through 19, 28 through 36, 70 through 72, 84, 85, 118 through 126, 129 through 132, 135, 218, 219, 229 through 238, 258 and 317 through 319 of Appendix C. Terminals compliant to MIL-STD 188-182 must meet requirements 9,10, 28, 29, 32, 48 through 50, 67, 68, 83 through 87, 90 through 92, 95, 169 through 177, and 203 of Appendix C.

II-1.3 Data Requirements

a. Criteria Related Data

(1) Format of transmitted Return Orderwires (ROWs)

(2) Terminal response to received Forward Orderwires (FOWs)

(3) Terminal response to illegal addresses

b. Supplemental Data

(1) Test configuration diagrams

(2) Software versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-1.4 Test Procedures

a. Test Conduct. Place the equipment in the Single Footprint (SF), Single Channel (SC) configuration as depicted in Figure 1. This test will be performed in two phases. During phase one, the terminals will be logged in on the network using legal addresses, and will cycle through the report status cycle, then will be logged out. Phase two will verify that the terminal does not allow the use of illegal addresses, and will verify the differences between Silent and Non-Silent terminals. Detailed test procedures are contained in Appendix D.

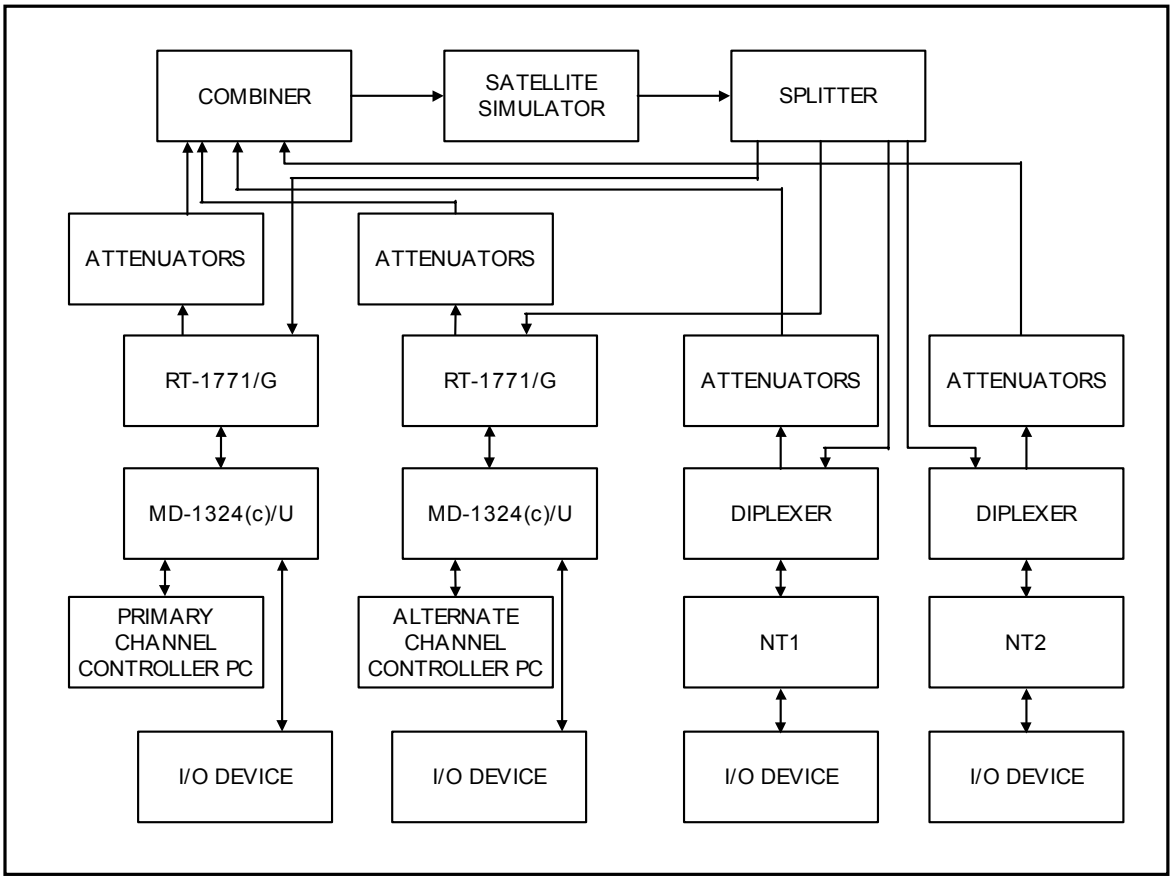

Figure 1. Single Footprint, Single Channel Test Configuration

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided in Appendix E. The Primary Channel Controller (PCC) and Alternate Channel Controller (ACC) event logs will be saved on disk for subsequent analysis.

II-1.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-1.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-2 ADDRESS MANAGEMENT

II-2.1 Objective. To determine if the terminal meets requirements related to terminal and guard list address management.

II-2.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 16 through 19, 125, 126, 239 through 245, 270 through 276 and 317 through 319 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 28, 29, 87, 178 through 184, and 218 through 224 of Appendix C.

II-2.3 Data Requirements

a. Criteria Related Data

(1) Format of ROWs

(2) Terminal response to received FOWs

(3) Terminal Guard Lists

(4) Terminal response to illegal address changes

(5) Cyclic Redundancy Check (CRC) verification

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-2.4 Test Procedures

a. Test Conduct. The equipment will be configured in the SF, SC configuration as depicted in Figure 1. The terminals will be logged on to the network and their address guard lists will be verified. The PCC will then direct that the terminals add or delete addresses to their guard lists, and the terminal actions and notifications to the operators will be verified. A status report will be requested from the terminals to determine whether the CRC is correct. The Diagnostic Modem Control Unit (DMCU), acting as the PCC, will then direct illegal address add or delete actions, and the terminal response to these messages will be verified. Detailed test procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided in Appendix E. The PCC and ACC event logs will be saved for subsequent analysis.

II-2.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-2.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-3 MESSAGE SERVICE OPTIONS

II-3.1 Objective. To determine if the terminal supports the required message service data rates and protocols.

II-3.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 2, 10 through 13, 15 through 19, 37, 45 through 58, 93 through 95, 113, 117, 125, 126, 134, 151, 152, 205 through 216, 246 through 249, 260 through 265, 268, 269, 277 through 286, 312, 313 and 317 through 319 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 2, 12, 13, 15 through 21, 24 through 26, 28, 29, 33 through 36, 72, 73, 78, 82, 87, 94, 117 through 120, 151 through 161, 185 through 188, 206, 207, 211, 213 through 217, 225 through 230, 233, 261, and 262 of Appendix C.

II-3.3 Data Requirements

a. Criteria Related Data

(1) Format of ROWs

(2) Terminal Response to received FOWs

(3) Verification of completion of message service

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-3.4 Test Procedures

a. Test Conduct. The equipment will be configured in the SF, SC configuration as depicted in Figure 1. Message services at each of the different precedence levels will be established and message traffic will be passed between terminals to determine if the terminal supports all the specified data rates in MIL-STD-188-182, Table V. Teardown of message services will be initiated both from the PCC and the terminal to determine whether the terminal correctly handles the teardown protocols. Encryption of the messages will be verified by correct reception of the data. Completion of the messages in the order of the assignments from the PCC, regardless of the order in which the terminal requested the services, will also be verified. Detailed test procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-3.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-3.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-4 CIRCUIT SERVICE OPTIONS

II-4.1 Objective. To determine if the terminal supports the required circuit service data rates and protocols.

II-4.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 2, 9, 11 through 13, 15 through 19, 37 through 44, 54 through 58, 92, 111 through 113, 117, 125, 126, 133, 134, 149 through 155, 157 through 204, 246 through 249, 260 through 269, 277 through 286, 312, 313, and 317 through 319 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 2, 11, 13, 15 through 21, 24 through 26, 28, 29, 33 through 36, 71, 76 through 78, 82, 87, 93, 94, 115 through 122, 124 through 150, 185 through 188, 194 through 197, 204, 205, 208 through 212, 225 through 230, 233, 261, and 262 of Appendix C.

II-4.3 Data Requirements

a. Criteria Related Data

(1) Format of ROWs

(2) Terminal response to received FOWs

(3) Verification of completion of circuit services

(4) Terminal operator notification of queued service timeout

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-4.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 1. Circuit services at each of the different precedence levels will be established and data traffic will be passed between terminals to determine if the terminal supports all the specified data rates in MIL-STD-188-182, Table IV. Teardown of circuit services will be initiated both from the PCC and the terminal to determine whether the terminal correctly handles the teardown protocols. Encryption of the data will be verified by correct reception of the data. Completion of the services in the order of the assignments from the PCC, regardless of the order in which the terminal requested the services, will also

be verified. Detailed test procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-4.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-4.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-5 BURST TYPE DETERMINATION

II-5.1 Objective. To determine if the terminal successfully interprets FOWs with errored bits.

II-5.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 14 and 156 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 22 and 123 of Appendix C.

II-5.3 Data Requirements

a. Criteria Related Data. Terminal Response to the FOWs

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-5.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 1. Errors will be inserted into the burst type field at the PCC, and the FOW reception will be verified to determine if the terminal can receive FOWs with errors. Detailed test procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC event log will be saved for subsequent analysis.

II-5.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-5.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

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II-6 FOW DROPOUT

II-6.1 Objective. To determine if the terminal performs correctly after missing FOWs.

II-6.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 67 through 69 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 45 through 47 of Appendix C.

II-6.3 Data Requirements

a. Criteria Related Data

(1) Terminal operational status after 20 missed FOWs

(2) Terminal operational status after 200 missed FOWs

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-6.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 1. The terminal will be logged on and a data circuit will be established between the terminal and the PCC. The terminal receive will be disconnected so that the terminal misses 20 FOWs, and then 200 FOWs. The operational status of the terminal will be determined. Detailed test procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-6.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-6.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-7 CONTENTION ROW MESSAGE

II-7.1 Objective. To determine if the terminal successfully implements the contention ROW protocols.

II-7.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 127, 128 and 136 through 143 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 88, 89 and 96 through 110 of Appendix C.

II-7.3 Data Requirements

a. Criteria Related Data

(1) Frame in which contention ROW is transmitted

(2) Transmit time-slots selected

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-7.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 1. The log-in attempt by the terminal will be blocked, and the retry protocol will be observed to determine if the terminal correctly implements the contention ROW backoff. Detailed test procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-7.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-7.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-8 NETWORK ENTRY AND ROLLOVER

II-8.1 Objective. To determine if the terminal correctly decrypts the FOW on network entry and follows end-of-day and directed key rollovers.

II-8.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 289, 290 and 292 through 311 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 235, 236, 238 through 250, and 252 through 260 of Appendix C.

II-8.3 Data Requirements

a. Criteria Related Data

(1) Verification of use of correct keys

(2) Verification of correct key rollover processing

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-8.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 1. The terminal will be logged in using the wrong initial key setting and should acquire the network utilizing the correct key. The terminal will also be logged in using the correct key. Manual and automatic key rollovers will be initiated at the PCC to determine whether the terminal follows the protocol and rolls over in the designated frame. Detailed test procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-8.5 Presentation of Results. Data obtained will be summarized and presented in narrative format.

II-8.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-9 TERMINAL/SYSTEM RESTRICTIONS

II-9.1 Objective. To determine if the terminal recognizes and complies with terminal and system restrictions.

II-9.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 114 through 116 and 250 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 79 through 81 and 189 of Appendix C.

II-9.3 Data Requirements

a. Criteria Related Data

(1) Verification that the terminal will not transmit requests with precedences that exceed the terminal access restriction

(2) Verification that the terminal will not transmit requests with a precedence lower than the system access restriction

(3) Verification that the terminal will not request 2400 bits per second (bps) service when system service restriction is “on”

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-9.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 1. The terminal will be logged in and will request services which exceed the terminal access restriction or which have a precedence below the system access restriction. The system service restriction will be turned “on”, and the terminal operator will attempt to request a 2400 bps service. The terminal response to these requests will be evaluated to determine whether the terminal properly implements these restrictions. Detailed test procedures are in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-9.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-9.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-10 TERMINAL NETWORK TRANSITION PROTOCOL

II-10.1 Objective. To determine if the terminal follows a transition of network control from the PCC to the ACC.

II-10.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 255 and 256 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 198 and 199 of Appendix C.

II-10.3 Data Requirements

a. Criteria Related Data

(1) Terminal response to FOW when service count is correct

(2) Terminal response to FOW when service count is incorrect

(3) Terminal response when no FOW is received

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-10.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 1. The terminals will be logged on to the system. Channel control will be transitioned from the PCC to the ACC, with one terminal receiving the correct service count and the other receiving an incorrect service count. Channel control will then be transitioned back to the PCC, and one terminal will not receive a FOW:Participant Status Data Base. Terminal actions in each situation will be evaluated to determine whether the terminal correctly implements the associated procedures. Detailed test procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-10.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-10.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-11 SERVICE PREEMPTION

II-11.1 Objective. To determine if the terminal properly processes preemption of services.

II-11.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 251 through 254 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 190 through 193 of Appendix C.

II-11.3 Data Requirements

a. Criteria Related Data

(1) Verification that the terminal processes all assigned services in the order assigned by the PCC

(2) Verification of notification of preemption

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-11.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 1. The terminals will be logged on to the system. Various voice and message services, at different precedences, will be requested by the terminals, causing preemption of some services. The terminal processing of the services and notification of preemption will be examined to determine whether the terminal properly handles the services. Detailed test procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-11.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-11.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-12 RETRANSMISSION FLAG

II-12.1 Objective. To determine if the terminal properly uses the retransmission flag.

II-12.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 144 through 148 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 111 through 114 of Appendix C.

II-12.3 Data Requirements

a. Criteria Related Data

(1) Verification of correct Retransmission Flag values

(2) Verification that Retransmission Flag is reset when required

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-12.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 1. The terminals will be logged on to the network. Various ROWs which require FOW responses will be transmitted; with some ROWs being blocked to force retransmission. The terminal response and use of the retransmission flag will be examined to determine whether the terminal properly implements the protocol. Detailed procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-12.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-12.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-13 FUTURE FOW RECEPTION

II-13.1 Objective. To determine if the terminal receives and parses future FOWs without faulting.

II-13.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirement 20 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirement 30 of Appendix C.

II-13.3 Data Requirements

a. Criteria Related Data

(1) Faults at any of the terminals

(2) Future FOW message content (received and displayed at ACC)

(3) Future System Message content (received and displayed at ACC)

(4) Location (in building block offset from start of frame) of preassigned circuit slot

(5) Location (in building block offset from start of frame) of ROW:Status Reports

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-13.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 1. The terminals will be logged on the network. The DMCU will be utilized to transmit future FOWs, and the terminal response to the FOWs will be evaluated to determine if it correctly interprets the FOWs. Detailed procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-13.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-13.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-14 CONTENTION RANGING BACK-OFF ALGORITHM

II-14.1 Objective. To determine if the terminal correctly implements the contention ranging back-off algorithm.

II-14.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 59 and 74 through 77 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 27, 37 and 52 through 61 of Appendix C.

II-14.3 Data Requirements

a. Criteria Related Data

(1) Selected ranging time-slot

(2) Use of the acquisition backoff number

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-14.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 1. The terminal will attempt to log on to the network, but its ranging will be blocked. The ranging backoff algorithm will be determined by observing the frames in which the terminal attempts to log in using the acquisition backoff number. Detailed test procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-14.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-14.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-15 DEDICATED CHANNELS

II-15. Objective. To determine if the terminal successfully transitions from DAMA to dedicated channels.

II-15.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 109, 110, 217 through 228 and 320 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 162 through 168, and 279 through 285 of Appendix C.

II-15.3 Data Requirements

a. Criteria Related Data

(1) Terminal response to FOWs

(2) Terminal ROW formats

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-15.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 1. The terminals will be logged on to the network. Assignment to dedicated channels will be requested, and the assignment and return to DAMA channel protocols will be observed to determine that the terminal correctly implements the protocols. Detailed test procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-15.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-15.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-16 DECODER PERFORMANCE

II-16.1 Objective. To determine if the terminal's encoder/decoder meets requirements.

II-16.2 Criteria. Terminals compliant to both MIL-STDs must meet requirement 1 of Appendix C.

II-16.3 Data Requirements

a. Criteria Related Data. Bit Error Rate (BER) measurements with uncoded and coded services

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-16.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 2. Bit Error Rate measurements will be made at 3000 and 2400 symbols per second (sps), uncoded and coded, to determine if the decoder provides the required gain. Detailed test procedures are contained in Appendix D.

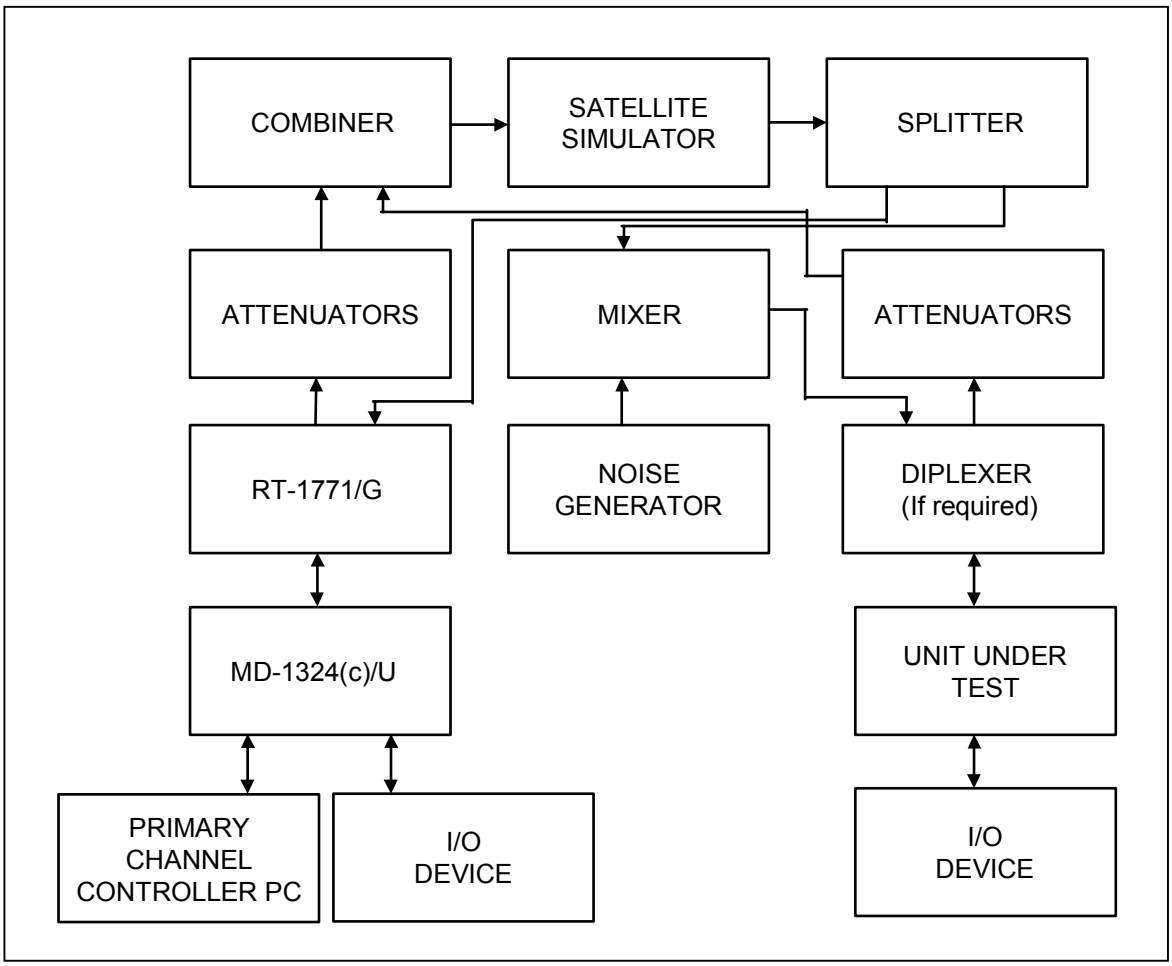

Figure 2. Decoder Performance

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided in Appendix E. The PCC and ACC event logs will be saved for subsequent analysis.

II-16.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-16.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-17 FOW ACQUISITION

II-17.1 Objective. To determine if the terminal meets requirements for FOW acquisition.

II-17.2 Criteria. Terminals compliant to both MIL-STDs must meet requirement 4 of Appendix C.

II-17.3 Data Requirements

a. Criteria Related Data. Number of missed FOWs during test period

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-17.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 2. The terminal will be logged in with noise injected on the link to establish a marginal Carrier to Noise Ratio (C/No). The receive terminal will be monitored to determine if the terminal misses FOWs or receives FOWs with incorrect Cyclic Redundancy Checks (CRCs). Detailed test procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-17.5 Presentation of Results. Data obtained will be summarized and presented in narrative format.

II-17.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

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II-18 C/NO ESTIMATION

II-18.1 Objective. To determine if the terminal accurately reports downlink C/No.

II-18.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 86-91 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 69 and 70 of Appendix C.

II-18.3 Data Requirements

a. Criteria Related Data

(1) C/No reported by terminal

(2) Actual C/No

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-18.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 2. Noise will be injected on the link to produce poor, medium and high link qualities. The reported terminal Eb/No will be compared to the actual Eb/No to determine whether the terminal correctly reports the link quality to the controller. Detailed test procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-18.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-18.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-19 UPLINK FREQUENCY ACCURACY

II-19.1 Objective. To determine if the terminal maintains the required uplink frequency accuracy.

II-19.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 5 and 6 of Appendix C. Terminals compliant to MIL-STD-188182 must meet requirements 7 and 8 of Appendix C.

II-19.3 Data Requirements

a. Criteria Related Data

(1) Terminal transmit offset frequency

(2) Terminal receive offset frequency

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-19.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 3. The maximum values of uplink Doppler, FOW error at the satellite, and oscillator error will be input and the transmit will be monitored to determine if the terminal successfully corrects its transmit to compensate for the shift. The receive will then be shifted 400 hertz (1200 hertz for airborne terminals) to determine if the terminal properly processes the signal as specified. Detailed test procedures are contained in Appendix D.

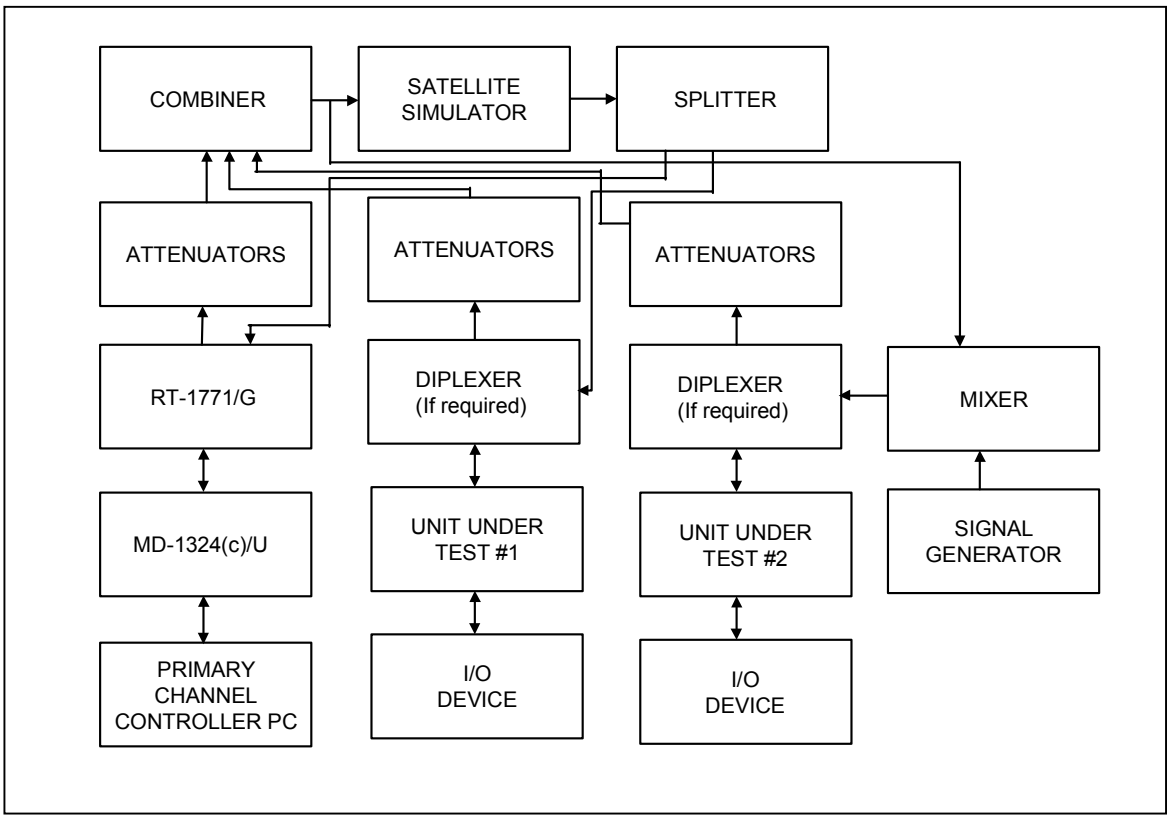

Figure 3. Uplink Frequency Accuracy

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-19.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-19.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-20 ADJACENT CHANNEL EMISSIONS (ACE)

II-20.1 Objective. To determine if the terminal transmit is within acceptable Adjacent Channel Emissions (ACE) levels.

II-20.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirement 287 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirement 234 of Appendix C.

II-20.3 Data Requirements

a. Criteria Related Data

(1) ACE measurements with power below 18 dBw

(2) ACE measurements with power above 18 dBw

(3) Adjusted ACE values

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-20.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 4. The terminal will be logged in on the network and a data circuit will be established between the terminal and the PCC. Data transmission will be initiated from the terminal and the adjacent channel emissions will be measured with the radio power below and above 18 dBw. Detailed test procedures are contained in Appendix D.

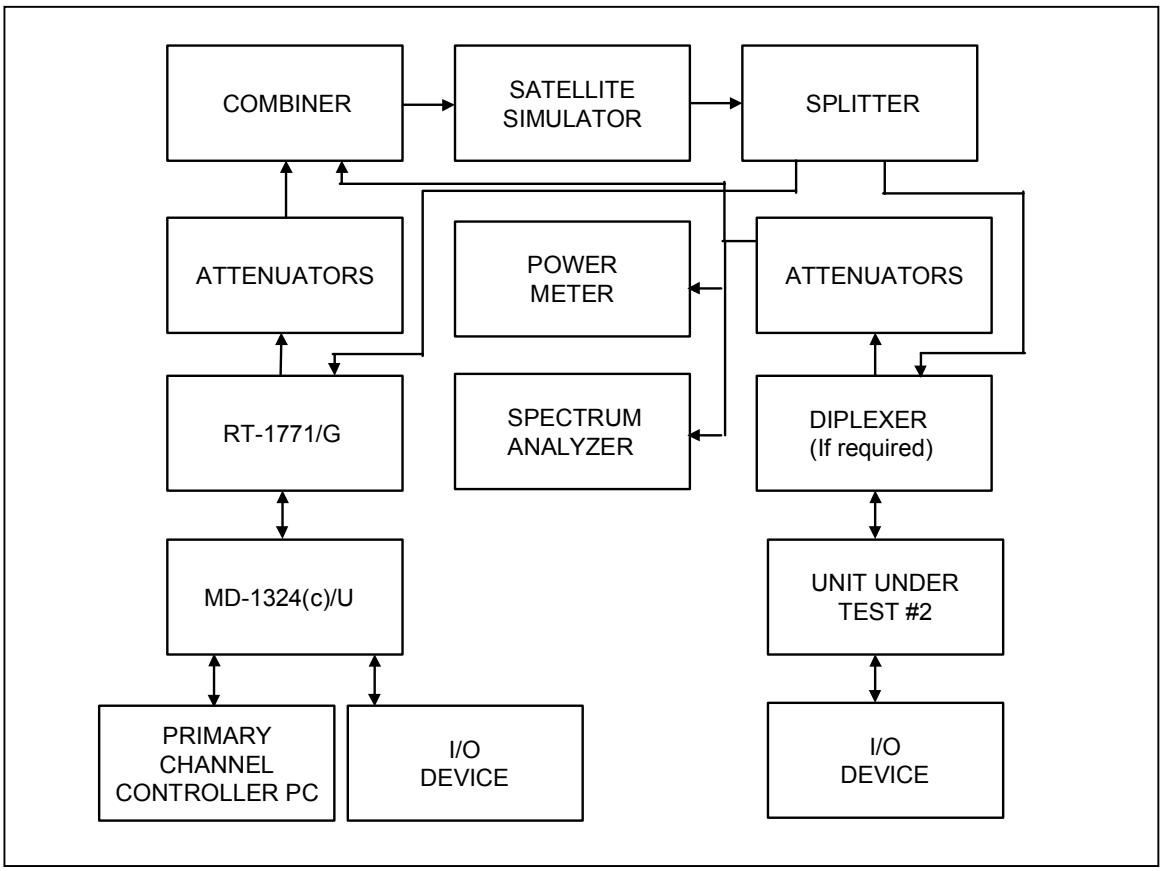

Figure 4. Adjacent Channel Emissions

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-20.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-20.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-21 MULTIPLE CHANNELS

II-21.1 Objective. To determine if the terminal correctly transitions to channels other than the one on which it is operating. Additionally, the terminal must properly respond to the FOW:Dedicated Channel Mode Countdown values and halt all 5-kHz DAMA operations in the proper frame.

II-21.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 96 through 108, 257 and 320 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 74, 75, 200 through 202, and 266 through 278 of Appendix C.

II-21.3 Data Requirements

a. Criteria Related Data

(1) Terminal response to a FOW assigning it to another channel

(2) Terminal acquisition of the new channel

(3) Terminal return when new channel cannot be acquired

(4) Verification that the terminal halts 5-kHz DAMA operations

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-21.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 5. The terminals will be logged in on the network. The terminals will be notified to change from one channel to the other. The terminals will be allowed to complete the transition, then will be blocked from acquiring the new channel. The transition and return to current channel protocols will be observed to determine whether the terminal correctly implements these protocols. Detailed test procedures are contained in Appendix D.

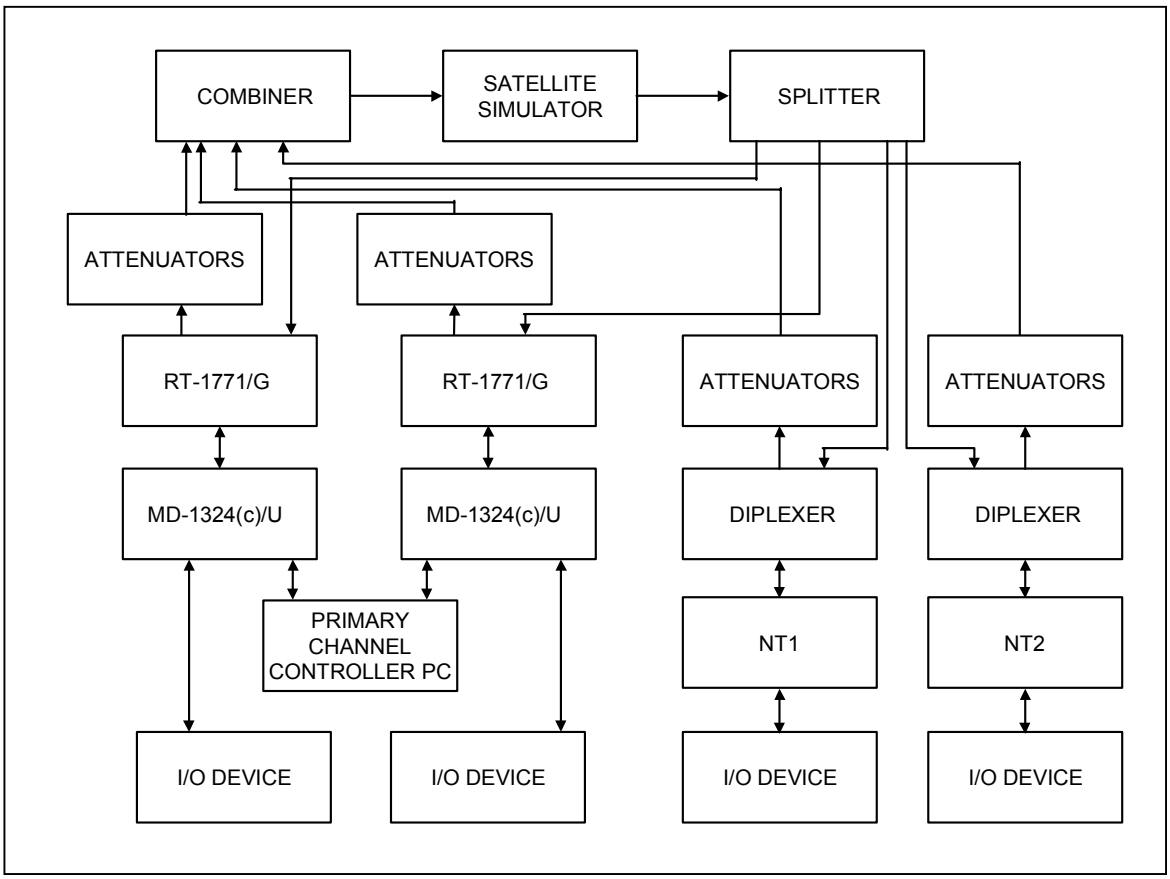

Figure 5. Single Footprint, Double Channel Test Configuration

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-21.5 Presentation of Results. Data obtained will be summarized and presented in narrative and narrative format.

II-21.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-22 RANGING

II-22.1 Objective. To determine if the terminal successfully determines satellite range over-the-air, and to verify voice and data interoperability.

II-22.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 21 through 27, 60 through 66, 73 and 78 through 83 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 31, 38 through 44, 51 and 62 through 66 of Appendix C.

II-22.3 Data Requirements

a. Criteria Related Data

(1) Satellite range measurement

(2) Verification that terminal aligns timing with PCC

(3) Verification of terminal timing alignment over 4.6 hours

(4) Verification of voice communications

(5) Verification of data communications

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be recorded and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-22.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 1. The satellite simulator will be set to 250 millisecond (ms) delay. The terminals will be logged on to the network. The range measurement and the terminal timing alignment with the PCC will be examined to determine whether the terminal accurately measures range to the satellite. Ranging intervals required to maintain terminal timing will be examined. Detailed test procedures are contained in Appendix D.

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-22.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-22.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

II-23 OVER-THE-AIR COMMUNICATIONS

II-23.1 Objective. To verify voice and data interoperability over the air.

II-23.2 Criteria. Terminals compliant to MIL-STD-188-182A must meet requirements 314 through 316 of Appendix C. Terminals compliant to MIL-STD-188-182 must meet requirements 263 through 265 of Appendix C.

II-23.3 Data Requirements

a. Criteria Related Data

(1) Verification of voice communications connectivity

(2) Verification of data communications connectivity

b. Supplemental Data

(1) Test Configuration Diagrams

(2) Software Versions tested

c. Data on Problems/Anomalies Encountered. Any problems or anomalies will be and researched to determine why they occurred. When appropriate, corrective action will be initiated and testing will be performed to validate the corrective action.

II-23.4 Test Procedures

a. Test Conduct. The equipment will be configured as depicted in Figure 6. The terminals will be logged on to the network. Data, voice, and message circuits will be established and two way communications will be verified. Detailed test procedures are contained in Appendix D.

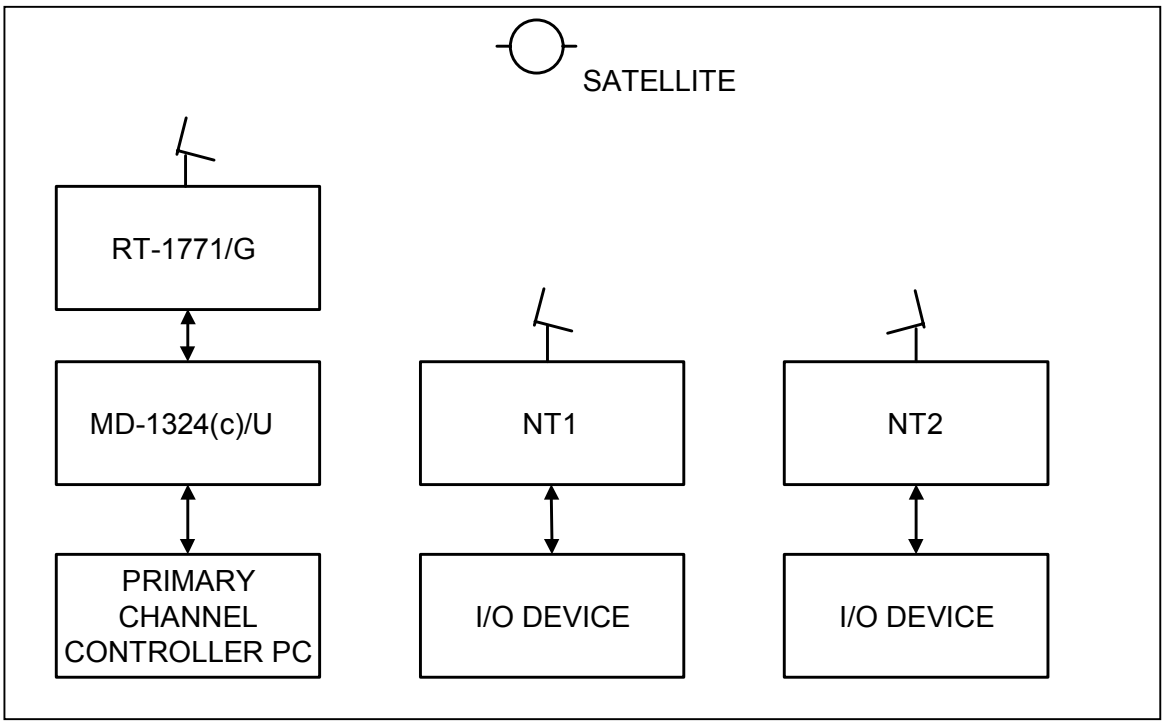

Figure 6. Over-The-Air Test Configuration

b. Data Collection. Data will be collected manually and will be entered on the data sheets provided. The PCC and ACC event logs will be saved for subsequent analysis.

II-23.5 Presentation of Results. Data obtained will be summarized and presented in narrative and tabular format.

II-23.6 Analysis and Discussion. The results will be reviewed against the criteria. When appropriate, additional testing will be performed to assist vendors in troubleshooting problems encountered. Testing will be performed to verify corrections to problems when provided by the vendor. Any failures to meet the criteria and their operational impact to the user will be discussed.

APPENDIX A

GLOSSARY

ACE	Adjacent Channel Emissions
ACC	Alternate Channel Controller
ADC	Automatic Data Controller
AFC	Automatic Frequency Change
ANDVT	Advanced Narrowband Digital Voice Terminal
BER	Bit Error Rate
BERTS	Bit Error Rate Test Set
bps	bits per second
C3I	Command, Control, Communications and Intelligence
CBK	Circuit Burst Kind
CCOW	Channel Control Orderwire
CJCSI	Chairman Joint Chiefs of Staff Instruction
COM	Communications
COMSEC	Communications Security
C/No	Carrier to Noise Ratio
CRC	Cyclic Redundancy Check
CTIC	COMSEC/TRANSEC Integrated Circuit
CTS	Clear to Send
DAMA	Demand Assigned Multiple Access
DASA	Demand Assigned Single Access
dB	Decibel
dB-Hz	Decibel per Hertz
dBw	Decibel relative to 1 watt
DC	Double Channel
DMCU	Diagnostic Modem Control Unit
DOD	Department of Defense
FOW	Forward Orderwire
I/O	Input/Output
IF	Intermediate Frequency
JCS	Joint Chiefs of Staff
JITC	Joint Interoperability Test Command
kHz	Kilohertz
MIL-STD	Military Standard
NCS	Network Control Station
NT	Nodal Terminal

OTAR	Over-the-Air Rekeying
PCC	Primary Channel Controller
ROW	Return Orderwire
RTS	Request to Send
SATCOM	Satellite Communications
SC	Single Channel
SF	Single Footprint
SOF	Start of Frame
SOQPSK	Shaped Offset Quadrature Phase Shift Keying
sps	Symbols per second
TAR	Terminal Access Restriction
TDMA	Time Division Multiple Access
TSN	Time Slot Number
UHF	Ultra-High Frequency

APPENDIX B

TEST RESOURCES/EQUIPMENT DESCRIPTIONS

B-1 TEST SITES AND FACILITIES. This test will be conducted at the JITC, Fort Huachuca, Arizona.

B-2 EQUIPMENT. The following equipment will be utilized for this test. The responsible organization will provide the equipment at the test site as indicated.

Item	Quantity	Responsible Organization
Satellite Terminal	2	USER
Network Control Station, consisting of:		
MD1324(C)/U Modem	2	JITC
RT-1771 /G Network Control Radio	2	JITC
Controller	2	JITC
Satellite Simulator	1	JITC
Spectrum Analyzer HP-8591E	1	JITC
Signal Generator	3	JITC
Noise Source	1	JITC
Coaxial Attenuators	4	JITC
Signal Combiners	2	JITC
Signal Splitters	2	JITC
Diplexer	2	JITC
KG-84A	2	JITC
ANDVT	2	JITC
Automatic Data Controllers	2	JITC
FIREBERD 6000	3	JITC
Personal Computers	4	JITC
Antennas	4	JITC

B-3 PERSONNEL. The following minimum personnel will be required to support the test and will be provided by the organization indicated.

Personnel	Quantity	Responsible Organization
Test Director	1	JITC
Test Conductor	1	JITC
Terminal Operator (As needed)	1	User

B-4. EQUIPMENT DESCRIPTIONS.

1. NETWORK CONTROL STATION. The 5-kHz NCS consists of an MD-1324(c)/U modem, transmitter/receiver, and an IBM-compatible computer which controls the modem. FOWs and control of the communications slots within the DAMA frame are provided by the NCS.

2. RT-1771/G Network Control Receiver/Transmitter. The RT-1771 is a modified RT-1273 which is a full-duplex UHF receiver/transmitter which operates in the 225-400 MHz band and is tunable in 5-kHz increments from the MD-1324(c)/U. This radio has been certified for use with the modem as a 5-kHz DAMA controller, and will be used as the receiver/transmitter for the ACC.

3. MD-1324(c)/U. The MD-1324(c)/U is the 5-kHz DAMA modem which has been certified as the Air Force NCS modem. This modem automatically tunes the radio and generates FOWs required to control the DAMA channel. Additionally, the modem generates all circuit and message assignments required to assign communications slots within the DAMA waveform.

APPENDIX C

MILITARY STANDARD 188-182 and 188-182A REQUIREMENTS MATRIX

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
1	4.2.2.2	1	4.2.2.2	The decoder performance gain shall be at least equal to that of the Viterbi decoder.	II-16
2	4.2.3.2	2	4.2.3.2	The modulation rates shall be 600, 800, 1200, 2400 and 3000 symbols per second (sps), as specified in Table III.	II-3, II-4
3	4.3 (1)	3	4.3 (1)	The transmit terminal power received at the satellite shall be at least -169 decibels relative to 1 watt (dBW).	Analysis
4	4.3 (2)	4	4.3 (2)	The terminal receiver system shall be designed to provide error-free reception of the FOW burst for at least 99 of 100 FOW bursts, with a confidence of 98 percent.	II-17
5	4.3 (3)		None	It shall be assumed that FOWs have an average length of 1400 bits, where bit length is the value indicated in the FOW field called *Length of this FOW* and that the controller power received at the satellite is at least -169 dBW.	Controller Requirement (Not Testable for Terminal)
6	4.3 (4)		None	Terminal specifications shall define the parameters that must be met for them to comply with the requirements of this paragraph.	Analysis
7	4.3.1 (1)		None	The uplink carrier frequency, as received at the satellite, shall be within 400 Hz of the allocated channel frequency.	II-19
	None	5	4.3.1 (1)	The terminal shall control uplink carrier frequency so the signal's carrier frequency at the satellite output is within 400 Hz of the allocated downlink channel frequency.	II-19
8	4.3.1 (2)		None	The terminal receiver system shall accommodate these amounts of uplink frequency offset in the terminal uplink frequency offset budget.	II-19
	None	6	4.3.1 (2)	The terminal receiver system shall accommodate these amounts of uplink frequency offset.	II-19
9	4.3.2 (1)	7	4.3.2 (1)	If a terminal has the capability to transmit and receive concurrently, then in the ROW:Login message and in the ROW:Status Report message the terminal shall identify itself as full-duplex.	II-1
10	4.3.2 (2)	8	4.3.2 (2)	If a terminal cannot concurrently receive and transmit, then the terminal shall identify itself as half-duplex.	II-1
11	4.4 (1)	9	4.4 (1)	Communications options available for circuit services shall be as specified in Table IV.	II-4
12	4.4 (2)	10	4.4 (2)	Communications options available for message services shall be as specified in Table V.	II-3
	None	11	5.1	The terminals shall synchronize and maintain synchronization with the frame.	II-3, II-4
13	5.1c	12	5.1c	Transmissions shall only occur during authorized time-slots.	II-3, II-4

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
	None	13	5.1.1	The terminal shall process and interpret the FOW fields as described below:	II-3, II-4
14	5.1.1		None	The fields and the number of bits for each field of a FOW shall be as illustrated in Figure 2 and described below.	Controller Require-ment
15	5.1.1a (1)		None	A preamble shall be transmitted as the initial part of each orderwire and communications burst.	II-3, II-4
16	5.1.1a (2)		None	The preamble format shall be a continuous wave (CW) carrier followed by a dot pattern.	II-3, II-4
17	5.1.1a (3)		None	Using shaped offset quadrature phase-shift keying (SOQPSK) modulation, the preamble during the CW portion shall be generated with constant data on both the I and Q channels (I = 1, Q = 1).	II-3, II-4
18	5.1.1a (4)		None	During the dot pattern portion, the preamble shall consist of alternating data on the I channel (I=0101...) and a constant phase (Q=1111...) on the Q channel.	II-3, II-4
19	5.1.1a (5)		None	The length of the preamble and the length of the CW carrier portion of each preamble shall be as defined in Table IV.	II-3, II-4
20	5.1.1b		None	The preamble shall be immediately followed by the 42-bit SOM sequence defined in Table VII.	II-3, II-4
21	5.1.1c (1)		None	The burst type field shall be as defined in Table VIII, and immediately follows the SOM sequence in each orderwire and communications burst.	II-3, II-4
22	5.1.1c (2)	14	5.1.1c (1)	Since this field is not coded, the terminal shall be able to identify the transmit burst type when the burst type is received with up to 3 bit errors in the 12 bits.	II-5
23	5.1.1c (3)		None	The start-of-frame burst type is used on the FOW burst only, and it shall not be transmitted by a terminal.	Controller Require-ment
24	5.1.1c (4)		None	The end-of-service burst type shall be used on any communications burst assignment for which the terminal is attempting to teardown the service, as described in 5.4.2.5.6.	II-3, II-4
25	5.1.1c (5)		None	The start-of-slot burst type shall be used on all other bursts.	II-3, II-4
26	5.1.1f	15	5.1.1f	With the Length of next FOW field information in the FOW bursts, and information in the directed message, the terminal shall determine the position of the time-slots in the next frame.	II-3, II-4
27	5.1.1g		None	The terminals that use active ranging shall use contention ranging slots in accordance with 5.2.2.1.1.	II-14

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
28	5.1.1h	16	5.1.1h (1)	The terminal shall interpret all system messages, comply with all applicable system messages, and ignore all system messages which were undefined at the time of terminal construction.	II-1, II-2 II-3, II-4
	None	17	5.1.1h (2)	FOW System Message fields shall be interpreted as specified in Appendix A.	II-1, II-2 II-3, II-4
29	5.1.1j (1)	18	5.1.1j (1)	All FOW requests, notifications, and assignments shall take effect during the frame following the one in which they are received.	II-1, II-2 II-3, II-4
	None	19	5.1.1j (2)	FOW directed message shall be interpreted as specified in Appendix B.	II-1, II-2 II-3, II-4
30	5.1.1j (2)	20	5.1.1j (3)	Terminals shall not fault on reception of any directed FOW message type that was not completely defined at the terminals' time of construction.	II-13
	None	21	5.1.2.1	ROW ranging bursts shall be comprised of six fields, as shown on Figure 3.	II-22
	None	22	5.1.2.1a	The preamble field shall be as defined in 5.1.1a for 800 sps modulation.	II-22
	None	23	5.1.2.1b	The start-of-message field shall be as defined in 5.1.1b.	II-22
31	5.1.2.1c	24	5.1.2.1c	The Burst Type field for a ranging time-slot shall be Start-of-Slot.	II-22
	None	25	5.1.2.1d	The Node Address field shall identify the transmitting terminal's login address.	II-22
	None	26	5.1.2.1e	The CRC field shall contain bits for error detection, as defined in 5.4.3.1.	II-22
	None	27	5.1.2.1f	The Flush field shall contain bits of value zero for flushing the FEC encoder.	II-22
	None	28	5.1.2.2 (1)	The ROW message burst shall be constructed in accordance with Figure 4.	II-1
	None	29	5.1.2.2 (2)	ROW messages shall be as specified in Appendix C.	II-1
	None	30	5.1.2.2 a	The Preamble field shall be as defined in 5.1.1 a for 2400 sps modulation.	II-1
	None	31	5.1.2.2 b	The Start-of-Message field shall be as defined in 5.1.1 b.	II-1
32	5.1.2.2c	32	5.1.2.2 c	The Burst Type field shall always be Start-of-Slot for ROW message time-slots (as defined in 5.1.1 c).	II-1
	None	33	5.1.2.2 d	The Node Address field shall identify the transmitting terminal's login address.	II-1
	None	34	5.1.2.2 e	The Message field shall contain the ROW message being transmitted to the PCC.	II-1
	None	35	5.1.2.2 f	The CRC field shall contain bits for error detection, as defined in 5.4.3.1.	II-1
	None	36	5.1.2.2 g	The Flush field shall contain bits of value zero for flushing the FEC encoder.	II-1
33	5.1.3	37	5.1.3	Network communications shall be conducted in an assigned time-slot within the frame's communications segment.	II-3 II-4

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
	None	38	5.1.3.1	The circuit-service burst shall consist of six fields, as illustrated on Figure 5.	II-4
	None	39	5.1.3.1a	The Preamble field shall consist of a variable number of bits based on the modulation rate, as defined in 5.1.1 a.	II-4
	None	40	5.1.3.1b	The Start-of-Message field shall be as defined in 5.1.1 b.	II-4
	None	41	5.1.3.1c (1)	The End-of-Service burst type defined in Table VIII shall be used on any COM burst for which the terminal is attempting to teardown the service, as described in 5.4.2.5.6.	II-4
	None	42	5.1.3.1c (2)	The Start-of-Slot burst type defined in Table VIII shall be used on all other bursts.	II-4
	None	43	5.1.3.1d	The User Data field shall contain user baseband data.	II-4
	None	44	5.1.3.1f	The Flush field shall contain bits of value zero for flushing the FEC encoder.	II-4
	None	45	5.1.3.2	The communications message-service burst shall be constructed as shown on Figure 6.	II-3
	None	46	5.1.3.2a	The Preamble field shall consist of a variable number of bits based on modulation rate, as defined in 5.1.1a.	II-3
	None	47	5.1.3.2b	The Start-of-Message field shall be as defined in 5.1.1b.	II-3
	None	48	5.1.3.2c (1)	The End-of-Service burst type defined in Table VIII shall be used on any COM burst for which the terminal is attempting to teardown the service, as described in 5.4.2.5.6.	II-3
	None	49	5.1.3.2c (2)	The Start-of-Slot burst type defined in Table VIII shall be used on all other bursts.	II-3
	None	50	5.1.3.2d	The Packet field shall contain an integer number of data blocks as defined in Table V.	II-3
	None	51	5.1.3.2e	The Unused Byte Counter field shall identify the number of unused (fill) bytes in the last message packet.	II-3
	None	52	5.1.3.2f	The CRC field shall contain bits for error detection, as defined in 5.4.3.1.	II-3
	None	53	5.1.3.2g	The Flush field shall contain bits of value zero for flushing the FEC encoder.	II-3
34	5.1.4 (1)	54	5.1.4 (1)	Data fields shall be transmitted in the sequence defined by Figures 3, 4, 5, 6, and 7.	II-3, II-4
35	5.1.4 (2)	55	5.1.4 (2)	For each field, the MSB (the left-most bit) shall be transmitted first.	II-3, II-4
	None	56	5.1.4.1 (1)	The first bit entering the terminal from the I/O device shall be the MSB (the left-most bit) appearing in the Packet field (for message service) or User Data field (for circuit service)	II-3, II-4
	None	57	5.1.4.1 (2)	...and shall be the first bit transmitted from the Packet or User Data field.	II-3, II-4
36	5.1.5	58	5.1.5	Each terminal shall ensure that its transmissions always fall within its allocated time-slots, as depicted in Figure 7.	II-3, II-4

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
37	5.1.5b (1)	59	5.1.5b (1)	Terminal design shall prohibit the use of the Contention Ranging time-slots except when (1) performing initial ranging (prior to login), or (2) its uplink timing error becomes excessive.	II-14
38	5.1.5b (2)	60	5.1.5b (2)	If active ranging is used, the terminal design shall allow the terminal to maintain sufficient uplink timing (that is, within 12.604 ms) for a period of at least 4.6 hours following a successful range.	II-22
39	5.2 (1)	61	5.2 (1)	Terminal timing shall be aligned with the PCC timing.	II-22
40	5.2 (2)	62	5.2 (2)	Prior to logging into the network, each terminal shall perform downlink and uplink acquisition to align its frame timing with that of the PCC.	II-22
41	5.2 (3)	63	5.2 (3)	Thereafter, each terminal shall track the downlink and perform ranging (active or passive) to maintain uplink timing.	II-22
42	5.2.1	64	5.2.1	Prior to initiation of any network transmission, the terminal shall perform downlink acquisition.	II-22
43	5.2.1a	65	5.2.1a	Initial frame acquisition shall involve (1) acquisition of downlink symbol timing by acquiring the FOW slot preamble, (2) acquisition of downlink slot timing by detecting the FOW slot SOM sequence, and (3) acquisition of frame timing by detecting the unique start-of-frame burst type indicator.	II-22
44	5.2.1b	66	5.2.1b	If the terminal achieves initial frame acquisition, the terminal shall attempt to interpret the FOW by proceeding with error correction decoding, decryption, and CRC validation.	II-22
45	5.2.1c (1)	67	5.2.1c (1)	The terminal shall terminate uplink transmission upon loss of the downlink synchronization (loss of the FOW).	II-6
46	5.2.1c (2)	68	5.2.1c (2)	If no FOW burst is received for 200 consecutive frames, the terminal shall assume that login and service request information at the PCC is lost.	II-6
47	5.2.1c (3)	69	5.2.1c (3)	If downlink acquisition is recovered within 200 frames, the terminal shall not log in or retransmit service requests which have been previously acknowledged by the PCC.	II-6
48	5.2.2 (1)	70	5.2.2 (1)	Prior to network log in, a terminal shall perform uplink acquisition.	II-1
49	5.2.2 (2)	71	5.2.2 (2)	Terminals that use active ranging shall range in the Contention Ranging time-slots of the ROW.	II-1
50	5.2.2.1 (1)	72	5.2.2.1 (1)	The terminal that performs active ranging shall set the Ranging Type field of the ROW:Login message to zero (0) (Active).	II-1
51	5.2.2.1 (2)	73	5.2.2.1 (2)	To perform active ranging, a terminal shall transmit a short burst in accordance with 5.1.2.1 and Figure 3 and shall measure the round-trip propagation time to the satellite.	II-22

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
52	5.2.2.1.1	74	5.2.2.1.1	If initial ranging is unsuccessful, subsequent ranging attempts shall occur in the Contention Ranging time-slots during frames determined by the algorithm defined in 5.2.2.1.2.	II-14
53	5.2.2.1.2 (1)	75	5.2.2.1.2 (1)	Following an unsuccessful attempt to range in a contention-ranging time-slot, the terminal shall select a frame and slot for further contention-ranging attempts.	II-14
54	5.2.2.1.2 (2)	76	5.2.2.1.2 (2)	The contention ranging ROW slot in which to retransmit the ROW ranging message shall be selected using an algorithm that uses two levels of randomization.	II-14
55	5.2.2.1.2 (3)		None	The contention ranging ROW time-slot selection process shall be as follows:	II-14
	None	77	5.2.2.1.2 (3)	The contention ranging ROW time-slot selection process shall be as defined in 5.2.2.1.2 a and b.	II-14
56	5.2.2.1.2a (1)		None	To determine the frame in which to retransmit the contention ranging ROW message, the terminal shall use the acquisition backoff number.	II-14
57	5.2.2.1.2a (2)		None	The terminal shall derive a uniformly distributed random number (U1) between 1 and the acquisition backoff number, inclusive.	II-14
58	5.2.2.1.2a (3)		None	Starting at the next frame, the terminal shall determine the accumulated number of contention ranging slots.	II-14
59	5.2.2.1.2a (4)		None	The frame in which the accumulated number equals or exceeds U1 shall be the frame for retransmission of the contention ROW ranging message.	II-14
60	5.2.2.1.2b (1)		None	To determine the contention ranging slot in which to retransmit the contention ROW ranging message, the terminal shall derive a uniformly distributed random number (U2) between 1 and the number of contention ranging slots inclusive, in the frame determined in a, above.	II-14
61	5.2.2.1.2b (2)		None	The terminal shall use the contention ranging ROW slot U2 for retransmission of the contention ROW ranging message.	II-14
62	5.2.2.1.3	78	5.2.2.1.3	If active ranging is used, the terminal shall range using the time-slot defined by the FOW:Ranging Assignment message.	II-22
	None	79	5.2.2.1.3	Terminal ranging in assigned versus contention ranging time slots shall be as follows:	II-22
63	5.2.2.1.3a (1)	80	5.2.2.1.3a (1)	If a terminal performs active ranging and does not receive a FOW:Ranging Assignment message within 4.5 hours since the time it most recently ranged successfully, or if the ranging in an assigned ROW time-slot is unsuccessful, the terminal shall request an assignment to range.	II-22
64	5.2.2.1.3a (2)	81	5.2.2.1.3a (2)	The request shall be sent in the contention portion of the ROW, using an ROW:Assign Ranging message.	II-22

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
65	5.2.2.1.3b (1)	82	5.2.2.1.3b (1)	If a terminal performs active ranging and does not successfully range prior to its uplink timing error being greater than +/-12.604 ms, the terminal shall inhibit transmissions (other than ranging) until ranging is successful.	II-22
66	5.2.2.1.3b (2)	83	5.2.2.1.3b (2)	If a terminal performs active ranging and its uplink timing error becomes excessive (that is, no longer within +/-12.604 ms), the terminal shall range in the contention-ranging time-slot as defined in 5.2.2.1.2.	II-22
67	5.2.2.2 (1)	84	5.2.2.2 (1)	Terminals that passively range shall report this to the PCC in the ROW:Login Message by setting the Ranging Type field to 1 (Passive).	II-1
68	5.2.2.2 (2)	85	5.2.2.2 (2)	The terminal shall then transmit a ROW ranging burst in accordance with 5.1.2.1 in the assigned ROW time-slot.	II-1
69	5.3 (1)		None	The terminal shall report the carrier-power-to-noise-spectral-density ratio (C/N_o) of received FOW within 1 dB.	II-18
70	5.3 (2)	86	5.3 (1)	The terminal shall report link quality to the PCC at login using a ROW:Login message or when requested using a ROW:Status Report message.	II-18
	None	87	5.3 (2)	The terminal shall report the carrier-power to noise-spectral-density ratio (C/N_o) of received FOW:	II-18
	None	88	5.3.2a	to within +/- 2 dB-Hz if reported within 5 minutes of downlink acquisition and the actual C/N_o is between 32.1 and 49.2 dB-Hz.	II-18
	None	89	5.3.2b	to within +/- 1 dB-Hz if reported more than 5 minutes after downlink acquisition and the actual C/N_o is between 32.1 and 49.2 dB-Hz.	II-18
	None	90	5.3.2c	as a value greater than 47 dB-Hz the actual C/N_o is greater than 49.2 dB-Hz.	II-18
	None	91	5.3.2d	as a value less than 34.5 dB-Hz the actual C/N_o is greater than 32.1 dB-Hz	II-18
71	5.4.1.1.1	92	5.4.1.1.1	The terminal shall provide circuit service at data I/O rates of 75, 300, 600, 1200, and 2400 bps and at the digital voice rate of 2400 bps, as indicated in Table XIII.	II-4
72	5.4.1.1.2 (1)	93	5.4.1.1.2 (1)	Messages shall be less than or equal to 114,688 bits which is equivalent to 512 blocks of 224 bits each.	II-3
73	5.4.1.1.2 (2)		None	Cryptographic equipment preambles and pad bits, and any I/O equipment overhead bits such as start, stop, and parity, shall be included in the 114,688-bit maximum.	II-3
	None	94	5.4.1.1.2 (2)	Cryptographic equipment preambles and pad bits shall be included in the 114,688-bit maximum.	II-3
	None	95	5.4.1.1.2 (3)	For asynchronous baseband equipment, start, stop, and parity bits, if not encrypted, shall be stripped by the transmitting terminal and reinserted by the receiving terminal.	II-3
	None	96	5.4.1.2	Multiple-channel operations shall take place on the channels listed in Appendix D.	II-21

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
74	5.4.1.2		None	Voice and data communications on dedicated channels shall be in accordance with MIL-STD-188-181.	II-21
	None	97	5.4.1.2.1 (1)	A terminal operating on a TDMA channel shall change to a new TDMA channel only when directed by the PCC.	II-21
	None	98	5.4.1.2.1 (2)	The direction to change channels shall be by the FOW:Terminal Channel Assignment message.	II-21
	None	99	5.4.1.2.1 (3)	The terminal shall change to the channel identified in the FOW.	II-21
	None	100	5.4.1.2.1 (4)	The terminal shall determine, based on the Channel Field and Appendix D, whether the assigned channel is 5- or 25-kHz.	II-21
	None	101	5.4.1.2.1 (5)	If the assigned channel is 5-kHz, the DAMA waveform shall be as specified in this standard.	II-21
	None	102	5.4.1.2.1 (6)	If the assigned channel is 25-kHz, the DAMA waveform shall be as specified in MIL-STD-188-183.	II-21
	None	103	5.4.1.2.1 (7)	The terminal shall attempt to attain downlink and uplink synchronization in the new channel.	II-21
	None	104	5.4.1.2.1 (8)	If the terminal cannot achieve downlink and uplink synchronization on the assigned channel within 90 seconds, the terminal shall return to the previous channel of operation.	II-21
	None	105	5.4.1.2.1 (9)	If the terminal is changing from a 5-kHz DAMA channel to another 5-kHz DAMA channel, the terminal shall retain all pending service requests it held in queue...	II-21
	None	106	5.4.1.2.1 (10)	...and shall not send a ROW:Login message on the new channel.	II-21
	None	107	5.4.1.2.1 (11)	If the terminal is changing from a 5-kHz DAMA channel to a 25-kHz DAMA channel, the terminal shall clear (delete) all pending service requests held in its queue.	II-21
	None	108	5.4.1.2.1 (12)	After the terminal has achieved downlink and uplink synchronization on a newly assigned TDMA channel (5- or 25-kHz), it shall not return to the previous channel or change to any other channel unless directed by the PCC	II-21
	None	109	5.4.1.2.2 (1)	While operating on a TDMA channel, the terminal shall change to a DASA channel only when directed by the PCC.	II-15
	None	110	5.4.1.2.2 (2)	Operation on the assigned DASA channel shall be as specified in 5.4.2.4.2.	II-15
75	5.4.1.3		None	Communication on the assigned 25-kHz TDMA channel shall be in accordance with MIL-STD-188-183.	II-21
	None	111	5.4.2.1.1	Preassigned circuit service management shall be as follows:	II-4

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
76	5.4.2.1.1d (1)	112	5.4.2.1.1d (1)	A terminal shall respond to normal FOW requests and commands while participating on a preassigned circuit.	II-4
77	5.4.2.1.1d (2)		None	Terminals shall not request a teardown for preassigned circuits.	II-4
78	5.4.2.1.2	113	5.4.2.1.2	Terminals shall originate each service request at one of five levels of precedence.	II-3 II-4
79	5.4.2.1.3.1	114	5.4.2.1.3.1	No service request whose precedence exceeds the terminal access restriction shall be transmitted by the terminal, unless the destination address is zero (numeric value). See 5.4.2.5.1.2.	II-9
80	5.4.2.1.3.2	115	5.4.2.1.3.2	A terminal shall not transmit a service request if the precedence is less than the system access restriction.	II-9
81	5.4.2.1.3.3	116	5.4.2.1.3.3	When the FOW system service restriction is specified as being on, a terminal shall not originate requests for 2400 bps multiple access channel circuit services.	II-9
82	5.4.2.1.4	117	5.4.2.1.4	A terminal shall not transmit except as permitted in this MIL-STD and authorized by the PCC.	II-3, II-4
83	5.4.2.1.5.1 (1)	118	5.4.2.1.5.1 (1)	A terminal shall prohibit any type of transmission other than ranging and login until it receives a positive login acknowledgment.	II-1
	None	119	5.4.2.1.5.1 (2)	The terminal shall report its link quality in the ROW:Login message.	II-1
	None	120	5.4.2.1.5.1 (3)	The terminal shall identify in the ROW:Login message whether or not it is capable of channel reassignment to (1) a single-access channel as defined in MIL-STD-188-181, within one frame (8.96 seconds); (2) another 5-kHz TDMA channel, as specified in this standard, within 90 seconds; and (3) a 25-kHz TDMA channel, as specified in MIL-STD-188-183, within 90 seconds.	II-1
84	5.4.2.1.5.1 (2)	121	5.4.2.1.5.1 (4)	A terminal shall select a random time to transmit a ROW:Login message in the contention portion of the ROW.	II-1
85	5.4.2.1.5.1 (3)	122	5.4.2.1.5.1 (5)	The random time shall be selected in accordance with 5.4.2.1.7.4.1.	II-1
	None	123	5.4.2.1.5.1 (6)	A terminal that has logged in and received a positive login acknowledgement shall ignore any subsequent FOW:Login Response messages.	II-1
86	5.4.2.1.5.1 (4)	124	5.4.2.1.5.1 (7)	If the terminal does not receive a Login response in the FOW, within the time specified in 5.4.2.1.7.4.2, it shall retransmit the message using the ROW acknowledgment/ retry protocol defined in 5.4.2.1.7.4.2.	II-1

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
	None	125	5.4.2.1.5.2.1 (1)	The terminal shall acknowledge specific FOW messages as required in Table X.	II-1, II-2 II-3, II-4
87	5.4.2.1.5.2.1	126	5.4.2.1.5.2.1 (2)	ROW messages responding to these FOW messages shall be transmitted within assigned ROW time-slots.	II-1, II-2 II-3, II-4
88	5.4.2.1.5.2.2 (1)	127	5.4.2.1.5.2.2 (1)	If no acknowledgement is received within four frames, the terminal shall use the acknowledgement/retry protocol specified in 5.4.2.1.7.4.2 for retransmission of the ROW message.	II-7
89	5.4.2.1.5.2.2 (2)	128	5.4.2.1.5.2.2 (2)	If no acknowledgment is received within four frames after retransmission, the terminal shall terminate the orderwire message retransmission attempt.	II-7
90	5.4.2.1.6.1 (1)	129	5.4.2.1.6.1 (1)	Whenever possible, a terminal shall logout by transmitting a ROW:Logout message in a contention ROW time-slot.	II-1
91	5.4.2.1.6.1 (2)	130	5.4.2.1.6.1 (2)	The terminal shall follow the protocol specified in 5.4.2.1.7.4.	II-1
92	5.4.2.1.6.1 (3)	131	5.4.2.1.6.1 (3)	If a logout response is not received, the terminal shall terminate the logout protocol and consider itself logged out of the network.	II-1
	None	132	5.4.2.1.6.2	A terminal is logged out, and shall not participate in the network, whenever a FOW:Logout Response message is received.	II-1
93	5.4.2.1.6.4 b	133	5.4.2.1.6.4 b	On receipt of the teardown, the terminal shall inform the operator that the service has been torn down by the PCC.	II-4
94	5.4.2.1.7.2	134	5.4.2.1.7.2	The position of a time-slot shall be determined from the ordering of assignments in the FOW burst.	II-3, II-4
95	5.4.2.1.7.3	135	5.4.2.1.7.3	The terminal receiving the first ROW assignment in the FOW shall transmit during the first assigned ROW time-slot (following the contention ranging time-slots), the second in the next, and so on.	II-1
96	5.4.2.1.7.4 (1)	136	5.4.2.1.7.4 (1)	A terminal shall identify the beginning of the contention ROW time-slots by analyzing the Length of Next FOW field and FOW directed messages that assign ROW capacity.	II-7
97	5.4.2.1.7.4 (2)	137	5.4.2.1.7.4 (2)	These contention ROW message time-slots shall immediately follow the assigned ROW time-slots.	II-7
98	5.4.2.1.7.4.1	138	5.4.2.1.7.4.1	The contention ROW time-slot within the frame shall be selected at random, based on a uniform distribution over the contention ROW time-slots within the frame.	II-7
99	5.4.2.1.7.4.2 (1)	139	5.4.2.1.7.4.2 (1)	Further retries shall not be automatic (will require operator intervention).	II-7

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
100	5.4.2.1.7.4.2 (2)	140	5.4.2.1.7.4.2 (2)	Terminals transmitting a contention ROW message shall expect to receive a FOW response.	II-7
101	5.4.2.1.7.4.2 (3)		None	Terminals that do not receive a response shall assume that the contention ROW message was not received by the PCC.	II-7
102	5.4.2.1.7.4.2 (4)	141	5.4.2.1.7.4.2 (3)	The contention ROW slot in which to retransmit the contention ROW message shall be selected using an algorithm that uses two levels of randomization.	II-7
103	5.4.2.1.7.4.2 (5)	142	5.4.2.1.7.4.2 (5)	The contention ROW time-slot selection process shall be as follows:	II-7
104	5.4.2.1.7.4.2 a (1)		None	To determine the frame in which to retransmit the contention ROW message, the terminal shall use the contention backoff number most recently transmitted by the PCC (in a FOW system message).	II-7
105	5.4.2.1.7.4.2 a (2)		None	The terminal shall derive a uniformly distributed random number (U1) between 1 and the contention backoff number, inclusive.	II-7
106	5.4.2.1.7.4.2 a (3)		None	Starting at the next frame, the terminal shall determine the accumulated number of contention ROW slots.	II-7
107	5.4.2.1.7.4.2a (4)		None	The frame in which the accumulated number equals of exceeds U1 shall be the frame for retransmission of the contention ROW message.	II-7
108	5.4.2.1.7.4.2 b (1)		None	To determine the contention ROW slot in which to retransmit the contention ROW message, the terminal shall derive a uniformly distributed random number (U2) between 1 and the number of contention ROW slots, inclusive, in the frame determined in a, above.	II-7
109	5.4.2.1.7.4.2 b (2)		None	The terminal shall use the contention ROW slot U2 for retransmission of the contention ROW message.	II-7
110	5.4.2.1.7.5a	143	5.4.2.1.7.5a	Within a contention ROW message, the terminal shall use the Retry Flag to indicate if the transmission is a first attempt or a retry.	II-7
111	5.4.2.1.7.5b	144	5.4.2.1.7.5b	Within an assigned ROW message, the terminal shall use the Retransmission Flag to indicate if the last contention ROW transmission was successful.	II-12
112	5.4.2.1.7.5 (1)	145	5.4.2.1.7.5 (1)	The terminal shall remember if the contention ROW message most recently transmitted was acknowledged.	II-12
113	5.4.2.1.7.5 (2)	146	5.4.2.1.7.5 (2)	The terminal shall set the Retransmission Flag if a response to a retransmitted contention ROW is not received within four frames.	II-12
114	5.4.2.1.7.5 (3)	147	5.4.2.1.7.5 (3)	The terminal shall reset the Retransmission Flag if (1) it receives a response to a contention ROW, (2) it detects a change in the ROW backoff number received in the FOW, or (3) 30 minutes has elapsed since the Retransmission Flag was set.	II-12

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
	None	148	5.4.2.1.7.5 (4)	In any assigned ROW message, the terminal shall set the Retransmission Flag field to the value of the internal retransmission flag.	II-12
115	5.4.2.2.1 (1)	149	5.4.2.2.1 (1)	To originate a circuit service, the terminal shall transmit a ROW:Circuit Setup message.	II-4
116	5.4.2.2.1 (2)	150	5.4.2.2.1 (2)	If a response is received, the terminal shall abort the ROW acknowledgment/retry protocol.	II-4
117	5.4.2.2.3 (1)		None	If the receiving terminal transfers data to the input/output device at a fixed rate based on the terminal's or input/ output device's internal clock, then a receive buffer shall be required.	II-3, II-4
118	5.4.2.2.3 (2)		None	If the transmitting terminal transfers data from the input/output device at a fixed rate based on the terminal's or input/output device's internal clock, then a transmit buffer shall be required.	II-3 II-4
119	5.4.2.2.3 (3)	151	5.4.2.2.3 (1)	Sufficient buffering in the terminal shall be provided to accommodate at least 1 hour for voice (182A) and 24 hours of continuous operation at a I/O device rate of 2400 bps.	II-3, II-4
120	5.4.2.2.3 (4)	152	5.4.2.2.3 (4)	The terminal clock accuracy shall be 1 X 10^{-6} or better.	II-3, II-4
	None	153	5.4.2.2.4	The size of the data field in each transmission burst, with the possible exception of the first burst and last two bursts, shall be N bits as shown in Table XIV.	II-4
	None	154	5.4.2.2.4.1 (1)	All bursts shall start at the beginning of the time slot.	II-4
121	5.4.2.2.4 (1)	155	5.4.2.2.4.1 (2)	With the possible exception of the last two bursts of a transmission, the same number of data bits shall be transmitted within each burst (N).	II-4
122	5.4.2.2.4 (2)		None	The size shall be N = (User I/O Rate) (8.96 seconds) where N is the nominal number of data bits sent in each burst.	II-4
123	5.4.2.2.4 (3)	156	5.4.2.2.4.1 (3)	The receiving terminal shall correctly interpret the CBK if no more than 2 bit positions of the 8-bit CBK are received in error.	II-5
	None	157	5.4.2.2.4.1a (1)	All fixed-voice bursts, except the first and last of a transmission, shall use the Normal Burst (Data or Fixed-Voice) format shown on Figure 8.	II-4
	None	158	5.4.2.2.4.1a (2)	The first burst shall use the First Burst (Data or Fixed-Voice) format shown on Figure 8, unless an entire transmission has N or fewer data bits.	II-4
	None	159	5.4.2.2.4.1a (3)	When the entire transmission has no more than N data bits, then the last burst (Fixed-Voice) format shown on Figure 8 shall be used in the first and only burst of the transmission.	II-4
	None	160	5.4.2.2.4.1a (4)	The last burst for fixed-voice shall always use the last burst (Fixed-Voice) format shown on Figure 8.	II-4

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
	None	161	5.4.2.2.4.1a (5)	Unused bits in the Data subfield shall be filled with the repeating 4-bit sequence 1001.	II-4
124	5.4.2.2.4a (1)		None	Unless an entire transmission has N or fewer data bits, the first burst for a voice circuit service shall use the first burst CBK format.	II-4
125	5.4.2.2.4a (2)		None	The CBK field for the first burst shall be 11111000.	II-4
126	5.4.2.2.4a (3)		None	All voice circuit service bursts, except the first and last of a transmission, shall use the nominal CBK format.	II-4
127	5.4.2.2.4a (4)		None	The CBK field for the nominal burst shall be 00000000.	II-4
128	5.4.2.2.4a (5)		None	All bursts for voice circuit service shall use the same burst format except that the CBK shall be set appropriately.	II-4
129	5.4.2.2.4a (6)		None	Unused bits in the data subfield shall be filled with the repeating 4-bit sequence 1001.	II-4
130	5.4.2.2.4a (7)		None	When the service is voice and the entire transmission has no more than N data bits, then the last burst CBK format shall be used in the first and only burst of the transmission.	II-4
131	5.4.2.2.4a (8)		None	The CBK field for the last burst shall be 10101111.	II-4
	None	162	5.4.2.2.4.1b (1)	All bursts except the first, second from last, and last burst of data transmissions shall use the Normal Burst (Data or Fixed-Voice) format shown on Figure 8.	II-4
	None	163	5.4.2.2.4.1b (2)	The first burst shall use the First Burst (Data or Fixed-Voice) format shown on Figure 8, unless an entire transmission has less than N data bits.	II-4
	None	164	5.4.2.2.4.1b (3)	If the entire transmission has N-80 or fewer data bits, only the Last Burst (Data) format shown on Figure 8 shall be used.	II-4
	None	165	5.4.2.2.4.1b (4)	When the entire transmission has fewer than N data bits but more than N-80 data bits, then the Second From Last Burst (Data) format shall be used for the first burst of the transmission...	II-4
	None	166	5.4.2.2.4.1b (5)	...and the Last Burst (Data) format shall be used for the last burst of the transmission.	II-4
	None	167	5.4.2.2.4.1b (6)	The Second From Last Burst (Data) format shall be used only if the remaining number of data bits is too small to fill a Normal Burst (Data or Fixed-Voice) format (fewer than N bits) and too large to fit into the Last Burst (Data) format (greater than N-80 bits).	II-4
132	5.4.2.2.4b (1)	168	5.4.2.2.4.1b (7)	Unused bits in the data subfield for data circuit service shall be filled with the repeating 4-bit sequence 1001.	II-4

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
	None	169	5.4.2.2.4.1b (8)	The data subfield shall contain N-80 bits.	II-4
	None	170	5.4.2.2.4.1b (9)	Unused bits in the Data plus Fill subfields shall be filled with the repeating 4-bit sequence 1001.	II-4
133	5.4.2.2.4b (2)	171	5.4.2.2.4.1b (10)	The Last Burst Count subfield shall contain a count of the number of non-fill data bits in the burst.	II-4
134	5.4.2.2.4b (3)	172	5.4.2.2.4.1b (11)	The count shall consist of a 16-bit binary number repeated 5 times to fill the 80-bit Last Burst Count subfield.	II-4
135	5.4.2.2.4b (4)	173	5.4.2.2.4.1b (12)	Each time the 16-bit number is repeated, the most significant bit shall be transmitted first.	II-4
136	5.4.2.2.4b (5)	174	5.4.2.2.4.1b (13)	The receiving terminal shall correctly interpret the Last Burst Count subfield if no more than 2 of the 16-bit binary numbers are received in error.	II-4
137	5.4.2.2.4b (6)		None	For the second from last burst, the CBK field shall be 01010111.	II-4
138	5.4.2.2.4b (7)		None	The 80-bit Last Burst Count subfield shall be filled with the repeating 4-bit sequence 1001, and the data subfield shall contain N-80 bits.	II-4
139	5.4.2.2.4b (8)		None	When the service is data and the entire transmission has no more than N-80 data bits, then the last burst CBK format shall be used in the first and only burst of the transmission.	II-4
140	5.4.2.2.4b (9)		None	When the service is data and the entire transmission has N or fewer data bits but more than N-80 data bits, then the second from last burst CBK format shall be used for the first burst of the transmission and the last burst CBK format shall be used in the second and last burst of the transmission.	II-4
	None	175	5.4.2.2.4.2 (1)	All transmission bursts other than the first and last shall use the Normal Burst format shown on Figure 9 and end within the allocated guard time at the end of the time slot.	II-4
	None	176	5.4.2.2.4.2 (2)	In all but the first and last bursts, the size of the User Data field shall be N as given in Table XIV for 2400 bps.	II-4
	None	177	5.4.2.2.4.2 (3)	The receiving terminal shall correctly interpret the CBK if no more than 2 bit positions of the 8-bit CBK are received in error.	II-4
	None	178	5.4.2.2.4.2a (1)	Unless an entire transmission can be sent within a single burst, the First Burst format, shown on Figure 9, shall be used for the first burst.	II-4
	None	179	5.4.2.2.4.2a (2)	If the entire transmission can be sent within a single burst, one of the two Last Burst formats shown on Figure 9 shall be used.	II-4

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
	None	180	5.4.2.2.4.2a (3)	If pre-fill bits are used, they shall be repeated hexadecimal 99 bytes.	II-4
	None	181	5.4.2.2.4.2a (4)	The first burst User Data field shall have an integer number of voice blocks.	II-4
	None	182	5.4.2.2.4.2a (5)	Transmission shall begin at any delay point of the time slot sufficient to transmit the integer number of voice blocks and end at the end of the time slot.	II-4
	None	183	5.4.2.2.4.2a (6)	The last (55th) voice block shall contain 384 coded voice bits followed by 64 fill bits having the pattern 10011001.., resulting in a full voice block having 448 over-the-air bits.	II-4
	None	184	5.4.2.2.4.2b (1)	The last burst of a subframed voice transmission that finishes with fewer than 96 bits from the end of the time-slot shall post-fill with sufficient hexadecimal 99 bytes and use the Last Burst format Type B that includes the CBK field.	II-4
	None	185	5.4.2.2.4.2b (2)	The last burst of a subframed voice transmission that finishes 96 bits or more from the end of the time-slot shall use the Last Burst format Type A which includes the 96-bit Over Code subfield and then post-fill bits before the Over Code to fill the last interleaver block.	II-4
	None	186	5.4.2.2.4.2b (3)	The Over Code is used to signal the availability of the channel and shall be the hexadecimal value F134F134 repeated three times.	II-4
	None	187	5.4.2.2.4.2b (4)	Each time the Over Code is repeated, the most significant bit F shall be transmitted first.	II-4
	None	188	5.4.2.2.4.2b (5)	The Over Code shall be appended to the transmit user data stream.	II-4
	None	189	5.4.2.2.4.2b (6)	The receiving terminal shall correctly interpret the Over Code subfield if any 32-bit F134F134 sequence of the 96-bit subfield is received without errors.	II-4
	None	190	5.4.2.2.4.2b (7)	Upon receipt of either a last burst CBK or Over Code, a receiving terminal shall be capable of initiating burst transmissions.	II-4
	None	191	5.4.2.2.4.2c (1)	When the entire transmission requires only a single burst, then one of the two last burst formats shall be used.	II-4
	None	192	5.4.2.2.4.2c (2)	If the burst will end with fewer than 96 bits from the end of the time-slot, then the Last Burst Type B format shall be used in the first and only burst of the transmission.	II-4
	None	193	5.4.2.2.4.2c (3)	When the entire transmission ends 96 bits or more from the end of the time-slot, then the Last Burst Type A format shall be used in the first and only burst of the transmission.	II-4
	None	194	5.4.2.2.4.2d	For sub-framed voice service, the TDMA throughput delay shall not exceed the maximum TDMA throughput delay given in Table XV.	II-4

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
141	5.4.2.2.5 (1)	195	5.4.2.2.5 (1)	For interfacing with asynchronous I/O equipment, the transmitting terminal shall strip start and stop bits, and the receiving terminal shall put these bits back onto the data stream.	II-4
142	5.4.2.2.5 (2)	196	5.4.2.2.5 (2)	The CBK field shall be 11111000 for the first burst of the transmission, shall be 00000000 for all but the first and last burst of the transmission, and shall be 10101111 for the last burst.	II-4
143	5.4.2.2.5 (3)	197	5.4.2.2.5 (3)	The receiving terminal shall correctly interpret the CBK if no more than 2 bit positions of the 8-bit CBK are received in error.	II-4
144	5.4.2.2.5 (4)	198	5.4.2.2.5 (4)	When the entire transmission has no more than N-80 data bits, the last burst CBK format shall be used in the first and only burst of the transmission.	II-4
145	5.4.2.2.5 (5)	199	5.4.2.2.5 (5)	Unused bits in the data subfield shall be filled with the repeating 4-bit sequence 1001.	II-4
146	5.4.2.2.5 (6)	200	5.4.2.2.5 (6)	The Burst Count subfield shall contain a count of the number of non-fill data bits in the burst.	II-4
147	5.4.2.2.5 (7)	201	5.4.2.2.5 (7)	The count shall consist of a 16-bit binary number repeated 5 times to fill the 80-bit Burst Count subfield.	II-4
148	5.4.2.2.5 (8)	202	5.4.2.2.5 (8)	Each time the 16-bit number is repeated, the most significant bit shall be transmitted first.	II-4
149	5.4.2.2.5 (9)	203	5.4.2.2.5 (9)	The receiving terminal shall correctly interpret the Burst Count subfield if no more than 2 of the 16-bit binary numbers are received in error.	II-4
150	5.4.2.2.6	204	5.4.2.2.6	When the PCC teardown command is received, terminals shall cease transmission pertaining to that service.	II-4
151	5.4.2.3.1 (1)	205	5.4.2.3.1 (1)	To originate a message service, the terminal shall transmit a ROW:Message Setup message.	II-3
152	5.4.2.3.1 (2)	206	5.4.2.3.1 (2)	If the terminal receives a response, the terminal shall abort the ROW acknowledgment/retry protocol.	II-3
153	5.4.2.3.2 (1)	207	5.4.2.3.2 (1)	Message information transmitted over the channel shall be arranged into packets.	II-3
154	5.4.2.3.2 (2)	208	5.4.2.3.2 (2)	A data block containing 224 message bits shall be the minimum packet size.	II-3
155	5.4.2.3.2b	209	5.4.2.3.2b	The terminal shall determine the time-slot size (number of building blocks required) for a message service from this information, as shown in Table V.	II-3
156	5.4.2.3.2.1	210	5.4.2.3.2.1	When polled by the PCC with the FOW:Acknowledge Blocks message, the destination terminal shall respond in a ROW:Blocks Acknowledgment message.	II-3
157	5.4.2.3.2.2 (1)		None	The ROW:Blocks Acknowledgment message is used with point-to-point message services and shall contain information to acknowledge the block up to which all blocks have been received correctly.	II-3

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
158	5.4.2.3.2.2 (2)		None	This procedure shall continue until all message data has been transmitted and acknowledged, or until the service is torn down.	II-3
159	5.4.2.3.2.5	211	5.4.2.3.2.5 (1)	The last packet shall use the unused-byte counter to identify the number of fill bytes that follow valid data bytes in the packet.	II-3
	None	212	5.4.2.3.2.5 (2)	Each fill byte shall have the pattern 10011001.	II-3
	None	213	5.4.2.3.2.5 (3)	These fill bytes shall be removed by the receiving terminal.	II-3
160	5.4.2.3.2.6b(1)	214	5.4.2.3.2.6b (1)	The receiving terminal shall send a ROW:Message Acknowledgment only after the terminal has successfully delivered the message to the terminal I/O device.	II-3
161	5.4.2.3.2.6b (2)		None	The terminal specification shall define if the message should be delivered to the I/0 device after the message has been completely and correctly received, or incrementally as continuous blocks are correctly received.	II-3
	None	215	5.4.2.3.2.6c	The source terminal shall not reuse the virtual port number in follow-on service requests until the service is torn down.	II-3
	None	216	5.4.2.3.3	The terminal shall implement the FOW:Message Teardown message in the frame following the one in which the message is received.	II-3
	None	217	5.4.2.4.1 (1)	Terminals requesting DASA service shall identify capabilities for DASA channel operations as specified in 5.4.2.1.5.1.	II-15
	None	218	5.4.2.4.1 (2)	Terminals that are operationally constrained from frequency changes shall identify that limitation using the ROW:Login message.	II-1 II-15
	None	219	5.4.2.4.1 (3)	Those terminals that are not capable of automatic frequency change shall indicate this message in the ROW:Login message when they log into a network, and will not be directed to change channels via the FOW:Terminal Channel Assignment message.	II-1 II-15
	None	220	5.4.2.4.1 (4)	Operation on the assigned channel shall be as specified in MIL-STD-188-181.	II-15
	None	221	5.4.2.4.1 (1)	The terminal shall determine, based on the Channel field and Appendix D, whether the assigned channel is 5- or 25-kHz.	II-15
162	5.4.2.4.1 (1)		None	Only terminals that are Automatic Frequency Change capable (ROW:Login message) shall respond to a FOW:Channel Assignment message by changing to the new channel.	II-15
163	5.4.2.4.1 (2)		None	Only terminals that are Automatic Frequency Change capable shall request an assignment of a dedicated channel.	II-15

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
164	5.4.2.4.2 (1)	222	5.4.2.4.2.1 (1)	When a FOW:Terminal Channel Assignment message is sent, a slot for an assigned ROW message is reserved and the terminal guarding that node address shall respond with a ROW:Terminal Channel Assignment Response message before switching to the dedicated channel.	II-15
165	5.4.2.4.2 (2)	223	5.4.2.4.2.1 (2)	The terminal shall reject any terminal channel assignment which it does not accept (as when it is participating in a higher precedence subnet service, for example), using the ROW:Terminal Channel Assignment Response message.	II-15
	None	224	5.4.2.4.2.1 (3)	Terminals that accept the DASA assignment shall switch to DASA operations within one frame time period following the transmission of the ROW message.	II-15
	None	225	5.4.2.4.2.2	Terminals not moving to the DASA channel shall continue processing active DAMA services in which they are a participant and retain pending service requests.	II-15
166	5.4.2.4.2 (3)	226	5.4.2.4.2.3 (1)	The terminal shall return to the initial TDMA channel prior to, or immediately after the allotted time assigned.	II-15
167	5.4.2.4.2 (4)	227	5.4.2.4.2.3 (2)	The terminal shall achieve downlink and uplink synchronization upon return to the initial TDMA channel.	II-15
168	5.4.2.4.2 (5)	228	5.4.2.4.2.3 (3)	The terminal shall send a ROW:Terminal Channel Return message in the contention ROW message time-slots for early re-entry into the TDMA network if the selected contention ROW message slot occurs before the end of the allocated dedicated channel time assigned.	II-15
169	5.4.2.5.1 (1)	229	5.4.2.5.1 (1)	Sixteen-bit addresses shall be used for identifying network nodes and subnets.	II-1
170	5.4.2.5.1 (2)	230	5.4.2.5.1 (2)	Each terminal shall receive the FOW messages and process those messages directed to its terminal node address or to any other address on its guard list.	II-1
171	5.4.2.5.1 (3)	231	5.4.2.5.1 (3)	Each terminal shall maintain an address guard list.	II-1
172	5.4.2.5.1 (4)	232	5.4.2.5.1 (4)	This guard list shall contain the node and subnet addresses for which the terminal receives services.	II-1
173	5.4.2.5.1.1	233	5.4.2.5.1.1	A terminal shall always use its unique terminal node address to identify itself in orderwire messages, that is, when logging into the network, requesting services, and in other orderwire messages.	II-1
174	5.4.2.5.1.2	234	5.4.2.5.1.2	Terminals shall not use address zero for a Login address or maintain address zero on their guard lists.	II-1
175	5.4.2.5.1.3	235	5.4.2.5.1.3	A subnet address shall not be used for a terminal node address.	II-1
176	5.4.2.5.2 (1)	236	5.4.2.5.2 (1)	A terminal shall report the number of addresses on its guard list and a guard list cyclic redundancy check (CRC) in the ROW:Login message.	II-1

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
177	5.4.2.5.2 (2)	237	5.4.2.5.2 (2)	Only node and subnet addresses shall be counted for the number of addresses in the Login message.	II-1
	None	238	5.4.2.5.2 (3)	For purposes of guard list reporting and guard list CRC calculation, the terminal shall arrange the order of node/subnet addresses in its guard list in ascending order, and place binary 0 in all empty address fields at the bottom of the guard list.	II-1
178	5.4.2.5.2a	239	5.4.2.5.2a	When requested by the PCC in one or more FOW:Report Terminal Address messages, the terminal shall report its guard list of node and subnet addresses in ROW:Terminal Address Report messages.	II-2
179	5.4.2.5.2b	240	5.4.2.5.2b	When reporting guard list addresses in the ROW:Terminal Address Report message, the terminal shall fill with zeros any fields corresponding to empty locations on the terminal address guard list.	II-2
180	5.4.2.5.2c (1)	241	5.4.2.5.2c (1)	The terminal shall update its address guard list, when requested by the PCC in a FOW:Terminal Address Add or Delete message.	II-2
181	5.4.2.5.2c (2)	242	5.4.2.5.2c (2)	The terminal shall respond to the FOW request with a ROW:Terminal Address Add or Delete Response message.	II-2
182	5.4.2.5.2c (3)		None	The terminal shall report a failure to delete an address only if the address is not on its guard list.	II-2
	None	243	5.4.2.5.2c (3)	The terminal shall always report that an address deletion was successful, whether or not the address was originally in the guard list.	II-2
183	5.4.2.5.2c (4)		None	The terminal shall report a failure to add an address only if the address is already on its guard list or the guard list already contains fifteen addresses in addition to the terminal node address.	II-2
	None	244	5.4.2.5.2c (4)	The terminal shall report a failure to add an address only if the address is not already on its guard list and the guard list is full.	II-2
184	5.4.2.5.2c (5)	245	5.4.2.5.2c (5)	If the terminal is involved in a receive service directed to a deleted address, the terminal shall ignore any further communications associated with the service.	II-2
185	5.4.2.5.3 (1)	246	5.4.2.5.3 (1)	Each service request shall be identified by a unique service identification number (0-4) known as the terminal virtual port number.	II-3, II-4
186	5.4.2.5.3 (2)	247	5.4.2.5.3 (2)	The terminal shall not reuse a virtual port number until the initial request with the virtual port number is no longer valid (such as is the case with a rejected request, a received teardown, or a timeout).	II-3, II-4
187	5.4.2.5.3 (3)	248	5.4.2.5.3 (3)	The terminal shall not use virtual port numbers greater than those permitted.	II-3, II-4

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
188	5.4.2.5.3a (1)	249	5.4.2.5.3a (1)	The terminal shall be capable of processing any assigned services in the sequence established by the PCC, independent of the services requested by the terminal.	II-3, II-4
189	5.4.2.5.3a (2)	250	5.4.2.5.3a (2)	Before transmission of a service request, the terminal shall validate the service request against terminal access restrictions, system access restrictions, and system service restrictions.	II-9
190	5.4.2.5.3b (1)	251	5.4.2.5.3b (1)	The terminal shall be capable of processing at least two active subnet message services as the service destination during a single frame while participating in one other active service of any type (as either the source or the destination).	II-11
191	5.4.2.5.3b (2)	252	5.4.2.5.3b (2)	The terminal shall process multiple assignments in the following manner:	II-11
192	5.4.2.5.3b (3)	253	5.4.2.5.3b (3)	If the terminal is assigned multiple services that it cannot process simultaneously (example being, both a point-to-point service and a subnet circuit service), it shall process the service with the highest precedence.	II-11
193	5.4.2.5.3b (4)	254	5.4.2.5.3b (4)	If the terminal is assigned multiple services at the same precedence level, it shall process the first service assigned and continue to process the service until the service is preempted, completed, or if the operator intervenes.	II-11
194	5.4.2.5.3c		None	The terminal shall automatically request teardown of any point-to-point service it will not process.	II-4
195	5.4.2.5.3d		None	The terminal shall automatically request teardown of any subnet service (for which it is identified as the source) that it will not process.	II-4
196	5.4.2.5.3e		None	The terminal shall not request teardown of a subnet service (for which it is identified as a destination) that it will not process.	II-4
197	5.4.2.5.3f		None	The terminal shall automatically request teardown of any service that falsely identifies it as the originator.	II-4
198	5.4.2.5.4.1 (1)	255	5.4.2.5.4.1 (1)	If the message is not received, the terminal shall consider that it is logged out and the terminal specification should define what action the terminal and the operator should take.	II-10
199	5.4.2.5.4.1 (2)	256	5.4.2.5.4.1 (2)	If a FOW:Participant Status Data Base message that reports the terminal's status is received, and the number of indicated services (either active or queued) does not agree with the number in the terminal's data base, the terminal shall send a service request message to the PCC for each service that should be active or queued.	II-10
200	5.4.2.5.4.2 (1)	257	5.4.2.5.4.2 (1)	When a FOW system message indicates a dedicated channel mode countdown is in progress, the terminal shall follow the FOW system message countdown and cease transmissions on that channel in the frame identified by the countdown message.	II-21

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
201	5.4.2.5.4.2 (2)		None	...and shall cease transmissions on that channel in the frame identified by the countdown message.	II-21
202	5.4.2.5.4.2 (3)		None	The terminal specifications shall define the detail requirements of the operator notification.	II-21
203	5.4.2.5.5	258	5.4.2.5.5 (1)	Terminals shall respond to a FOW:Report Status message from the PCC by transmitting a ROW:Status Report message in the assigned ROW time-slot.	II-1
	None	259	5.4.2.5.5 (2)	Contention time slot reporting shall not be used by operator-initiated action to report: (1) a change in link quality unless link quality has changed by more than 2 dB from the most recently reported value or (2) a change in the Retransmission Field flag.	II-12 II-18
	None	260	5.4.2.5.6	Terminals shall request teardown of circuit or message service under the conditions specified in this paragraph.	II-3 II-4
	None	261	5.4.2.5.6.1	Terminal teardown requests for all services shall be as specified in this paragraph.	II-3, II-4
	None	262	5.4.2.5.6.1a	Terminals shall automatically request teardown of: (1) any circuit service the terminal originated but will not process upon initial assignment; (2) any message service the terminal originated but will not process; or (3) any point-to-point service for which the terminal is the source or destination and which it will not process.	II-3 II-4
	None	263	5.4.2.5.6.1b	Terminals shall not request teardown of: (1) any preassigned service; or (2) any service the terminal did not originate and the conditions of 5.4.2.5.6.1a (3) do not apply.	II-3 II-4
204	5.4.2.5.6.1.1.1		None	The terminal shall not request teardown of an active subnet circuit service that it did not originate.	II-4
205	5.4.2.5.6.1.1.2		None	The terminal shall not request teardown of a queued circuit service that it did not originate.	II-4
206	5.4.2.5.6.1.2.1		None	The terminal shall not request teardown of an active subnet message service that it did not originate.	II-3
207	5.4.2.5.6.1.2.2		None	The terminal shall not request teardown of a queued message service that it did not originate.	II-3
	None	264	5.4.2.5.6.2.1 (1)	The source terminal requesting the service teardown shall transmit a preamble, an SOM sequence, and an end-of-service burst type in each assigned communications time-slot.	II-3, II-4
208	5.4.2.5.6.2.1.1 (1)		None	The terminal (either source or destination) requesting the service teardown shall transmit a preamble, an SOM sequence, and an end-of-service burst type in each assigned communications time-slot.	II-4

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
	None	265	5.4.2.5.6.2.1 (2)	The source terminal shall transmit a ROW:Teardown message in the contention portion of the ROW segment if, after the fourth frame following the frame in which the terminal transmitted the first End-of-Service bit sequence in the Burst Type field, a FOW:Teardown message has not been received.	II-3, II-4
209	5.4.2.5.6.2.1.1 (2)		None	The terminal shall transmit a ROW:Circuit Teardown message in the contention portion of the ROW if, after the fourth frame following the time the teardown request is originated, the response has not been received.	II-4
210	5.4.2.5.6.2.1.1 (3)	266	5.4.2.5.6.2.1 (3)	The terminal shall continue to transmit the preamble, SOM sequence, and end-of-service burst type field in each assigned communications time-slot until a FOW:Circuit Teardown message is received.	II-4
	None	267	5.4.2.5.6.2.1 (3)	If the terminal requesting the teardown is a point-to-point destination terminal, then it shall follow the protocol defined in 5.4.2.5.6.2.2.	II-4
211	5.4.2.5.6.2.1.2 (1)	268	5.4.2.5.6.2.2 (1)	The source terminal requesting teardown shall transmit a ROW:Circuit Teardown message.	II-3, II-4
212	5.4.2.5.6.2.1.2 (2)	269	5.4.2.5.6.2.2 (2)	The terminal shall assume the service has been torn down if it receives no response to the request.	II-4
213	5.4.2.5.6.2.2.1 (1)		None	The source terminal shall transmit a preamble, a SOM sequence, and an end-of-service burst type in each assigned communications time-slot.	II-3
214	5.4.2.5.6.2.2.1 (2)		None	The terminal shall transmit a ROW:Message Teardown message in the contention portion of the ROW if, after the fourth frame following the time the teardown request is originated, the response has not been received.	II-3
215	5.4.2.5.6.2.2.1 (3)		None	The terminal shall continue to transmit the preamble, SOM sequence, and end-of-service burst type field in each assigned communications time-slot until a FOW:Message Teardown message is received.	II-3
216	5.4.2.5.6.2.2.2 (1)		None	The source terminal requesting teardown shall transmit a ROW:Message Teardown message.	II-3
217	5.4.2.5.6.2.2.2 (2)		None	The terminal shall assume service has been torn down if it receives no response to the request.	II-3
218	5.4.3.1 (1)		None	Two CRC code lengths shall be used for error detection.	II-2
219	5.4.3.1 (2)	270	5.4.3.1 (1)	A long code (16 bits) shall be used on the FOW transmissions, on message service data blocks, and as a check of guard-list consistency.	II-2
220	5.4.3.1 (3)	271	5.4.3.1 (2)	A short code (8 bits) shall be used on the ROW message and ROW ranging transmissions.	II-2

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
221	5.4.3.1 (4)	272	5.4.3.1 (3)	Only bursts received correctly, as determined by the CRC, shall be used by the terminal for FOW transmissions and ROW ranging transmissions.	II-2
222	5.4.3.1 (5)	273	5.4.3.1 (4)	The generator polynomials for the long and short codes, respectively, shall be as given below (see Page 70).	II-2
	None	274	5.4.3.1 (5)	The transmitted CRC shall be equivalent to that obtained by performing the following steps.	II-2
	None	275	5.4.3.1 (6)	The CRC bits shall be transmitted MSB (higher order term) first.	II-2
223	5.4.3.1b (1)		None	All address fields of the 15-address guard list for which there is no guarded address shall be zero filled for the CRC calculation, and the CRC is computed over a 256-bit data field.	II-2
224	5.4.3.1b (2)	276	5.4.3.1b (2)	All zero fill shall occur at the end of the valid guard list addresses.	II-2
225	5.4.3.2	277	5.4.3.2	Forward error correction (FEC) encoding shall be performed using a rate 1/2, constraint length seven convolutional code (Figure 10).	II-3, II-4
	None	278	5.4.3.2.1	Higher rate 3/4 and 7/8 codes shall be derived from the rate 1/2 code using the puncture pattern shown in Table XVII.	II-3, II-4
226	5.4.3.3 (1)	279	5.4.3.3 (1)	The block interleaving structure shall consist of two independently constructed blocks of 112 code bits used in sequence.	II-3, II-4
227	5.4.3.3 (2)	280	5.4.3.3 (2)	The interleaving process shall be equivalent to writing input bits into the 112-bit blocks sequentially as shown in the input order columns of tables XVIII and XIX and read out in the order dictated by the output order columns of the tables.	II-3, II-4
228	5.4.3.3 (3)	281	5.4.3.3 (3)	Deinterleaving shall reverse this operation.	II-3, II-4
229	5.4.3.3 (4)	282	5.4.3.3 (4)	Interleaver boundaries shall start at the beginning of the data field within each burst for circuit services (see Figure 5); they shall start at the beginning of the data block within each packet for message service (see Figure 6); with the first interleaved bit of the burst in the first position defined by the block of Table XVI.	II-3, II-4
	None	283	5.4.3.3 (5)	For the coding rates for which the number of bits out of the encoder are not sufficient to fill the last interleaver block, fill bits shall be added resulting in a full interleaver block having 112 over-the-air bits.	II-3, II-4
	None	284	5.4.3.3 (6)	The fill bits shall have the pattern 10011001.	II-3, II-4
230	5.4.4.1 (1)	285	5.4.4.1 (1)	The modulation for all transmissions shall be interoperable with shaped offset quadrature phase-shift keying (SOQPSK).	II-3, II-4
231	5.4.4.1 (2)		None	The modulation used shall have spectral containment equal to or better than constant envelope SOQPSK.	Not Testable

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
232	5.4.4.1c		None	The spectral shaping used during modulation, including additive noise, shall introduce no greater than a 1.0 dB degradation in a receiver's performance, if the receiver uses matched-filter demodulation and expects the incoming signal to have 50 percent sinusoidally shaped modulation, as illustrated in Figure 11.	Not Testable
233	5.4.4.2	286	5.4.4.2	The modulation rates shall be 600, 800, 1200, 2400, and 3000 sps, as specified in Table III.	II-3, II-4
234	5.4.4.3	287	5.4.4.3	In a nominal 5-kHz bandwidth whose center frequency is displaced by ΔF from a terminal transmitter's carrier frequency, the EIRP shall be as specified in Table XVIII. (Table XX for -182A)	II-20
	None	288	5.4.4.4	The terminal's modulated output, including additive noise, shall introduce no greater than a 0.2 dB degradation in a receiver's performance, if the receiver uses matched filter demodulation and expects the incoming signal to have 50 percent sinusoidally shaped modulation, as illustrated on Figure 12.	Not Testable
235	5.5.1 (1)	289	5.5.1 (1)	All orderwires shall be encrypted for normal transmission, however an orderwire encryption/decryption bypass shall be provided.	II-8
236	5.5.1 (2)	290	5.5.1 (2)	Orderwire encryption/decryption shall be performed using the COMSEC/TRANSEC Integrated Circuit (CTIC) or an alternate NSA-approved device that is cryptographically and functionally compatible with the CTIC implementing KGV-11 as specified in NSA specifications 88-4A and 87-1.	II-8
237	5.5.1 (3)	291	5.5.1 (3)	Hardware implementation of the terminal shall include provisions for future implementation of Over the Air Rekeying (OTAR) for the orderwire.	Not Testable
238	5.5.1 (4)	292	5.5.1 (4)	Inputs to the TRANSEC encryption/decryption process shall be a cryptographic key and an initialization vector called the Time Slot Number (TSN).	II-8
239	5.5.1.1 (1)	293	5.5.1.1 (1)	The terminal shall have storage for up to eight TRANSEC keys.	II-8
240	5.5.1.1 (2)	294	5.5.1.1 (2)	Each TRANSEC key shall be loaded into a specific location in the terminal's key storage memory, numbered from 0 to 7.	II-8
	None	295	5.1.1.1 (3)	The new COMSEC key shall take effect in the frame after the fourth FOW:Time Slot Change Countdown message.	II-8
241	5.5.1.1 (3)	296	5.5.1.1 (3)	When a terminal enters the network, it shall try all loaded TRANSEC keys until it correctly decrypts the FOW (determined by a correct CRC).	II-8
242	5.5.1.1 (4)	297	5.5.1.1 (4)	If the terminal enters the network during the Time Slot Countdown, it will have missed the Next Key Indicator and shall determine the next key using the trial process for all stored TRANSEC keys (until obtaining the correct CRC).	II-8

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
243	5.5.1.2 (1)	298	5.5.1.2 (1)	A 39-bit TSN shall be used as the cryptographic initialization vector for the CTIC.	II-8
244	5.5.1.2 (2)	299	5.5.1.2 (2)	This TSN shall have four fields, as shown in Figure 12 (Figure 13 in -182A) and as described below.	II-8
245	5.5.1.2a	300	5.5.1.2a	The Net number shall be 127 (1111111).	II-8
246	5.5.1.2c (1)	301	5.5.1.2c (1)	It shall be coded from 0 through 1023 for the first through one thousand twenty fourth building block in the frame.	II-8
247	5.5.1.2c (2)	302	5.5.1.2c (2)	The Frame Offset field shall be zero for the FOW.	II-8
248	5.5.1.2d (1)	303	5.5.1.2d (1)	This field shall start at a value of zero for all encryptions and decryptions.	II-8
249	5.5.1.2d (2)	304	5.5.1.2d (2)	The TSN for encryption of the orderwire shall be generated using the Frame Number and Frame Offset of the time slot within which the orderwire is transmitted.	II-8
250	5.5.1.2d (3)	305	5.5.1.2d (3)	The TSN for decryption of the orderwires shall be generated using the Frame Number and Frame Offset of the time slot within which the orderwire was received.	II-8
251	5.5.1.3b		None	The generation of the CRC is now completed and the CRC shall be added to the end of the already built FOW.	Controller Require-ment
	None	306	5.5.1.4	Decryption of the FOW shall result in an output identical to that obtained from the following sequence:	II-8
252	5.5.1.4b		None	The remaining FOW data shall be error correction decoded.	II-8
253	5.5.1.4d		None	The CTIC shall be initialized to operate in Mode B Decrypt Common Synchronization, using the TSN as defined in 5.5.1.	II-8
254	5.5.1.4e		None	The FOW shall be decrypted beginning with the MSB of the PCC address and ending with the LSB of the CRC.	II-8
255	5.5.1.4f		None	A CRC shall be computed on the decrypted data and compared with the CRC Field (see 5.4.3.1).	II-8
	None	307	5.5.1.5	Encryption of the ROW shall result in an output identical to that obtained from the following processing sequence:	II-8
256	5.5.1.5b	308	5.5.1.5b	The generation of the CRC shall now be completed and the CRC shall be added to the end of the already built ROW.	II-8
257	5.5.1.5c		None	The CTIC shall be initialized to operate in Mode B Encrypt Common Initialization, using the TSN as defined in 5.5.1.	II-8

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
258	5.5.1.5d		None	The ROW shall be encrypted beginning with the MSB of the Node Address and ending with the LSB of the CRC.	II-8
259	5.5.1.5e		None	The resulting ROW shall now be error correction encoded (see 5.4.3.2).	II-8
260	5.5.1.5f		None	The preamble, Start-of-message indicator, and Burst Type fields shall be added to the beginning of the ROW.	II-8
	None	309	5.5.1.7 (1)	When a terminal receives a FOW:Zeroize message (FOW 31) it shall compare the Address 1 and Address 2 fields.	II-8
	None	310	5.5.1.7 (2)	If the values of these two fields are identical and match the terminal's node address, the terminal shall zeroize the eight locations in its key storage memory.	II-8
	None	311	5.5.1.7 (3)	If the two fields are not identical, the terminal shall ignore the FOW.	II-8
261	5.5.2 (1)	312	5.5.2 (1)	The terminal originating a service request shall indicate whether or not the user data is to be encrypted.	II-3, II-4
262	5.5.2 (2)	313	5.5.2 (2)	Terminals shall transmit user data in plain text only if authorized by the terminal operator.	II-3, II-4
263	5.5.2.1	314	5.5.2.1	For joint operations, secure voice at 2400 bps shall be interoperable with the digitization and encryption techniques used in the Advanced Narrowband Digital Voice Terminal (ANDVT), application 3 (see MIL-C-28883A).	II-23
264	5.5.2.2 (1)	315	5.5.2.2 (1)	For joint operations, data encryption shall be interoperable with KYV-5 and KG-84A encryption devices.	II-23
265	5.5.2.2 (2)	316	5.5.2.2 (2)	Terminals that embed COMSEC devices shall support all data rates specified in this MIL-STD for communication over the DAMA channel.	II-23
266	5.6 (1)		None	Multiple channel network operations shall take place on the channels listed in Appendix D.	II-21
267	5.6 (2)		None	Those terminals that are not "automatic frequency change" capable shall indicate this in the ROW:Login message when they log into a network, and will not be commanded to change channels via the FOW:Terminal Channel Assignment message.	II-21
268	5.6.1 (1)		None	While operating on a TDMA channel, the terminal shall change to a new channel only when directed to by the PCC.	II-21
269	5.6.1 (2)		None	The direction to change channels shall be by the FOW:Terminal Channel Assignment message.	II-21
270	5.6.1 (3)		None	The terminal shall change to the channel identified in the message.	II-21
271	5.6.1 (4)		None	The terminal shall determine, based on the Channel field and Appendix D, whether the assigned channel is 5- or 25-kHz.	II-21

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
272	5.6.1 (5)		None	If the channel is a 5-kHz, the DAMA waveform shall be in accordance with MIL-STD-188-182.	II-21
273	5.6.1 (6)		None	If the assigned channel is 25-kHz, the DAMA waveform shall be in accordance with MIL-STD-188-183.	II-21
274	5.6.1 (7)		None	The terminal shall achieve downlink and uplink synchronization in the new channel.	II-21
275	5.6.1 (8)		None	If the terminal cannot achieve downlink and uplink synchronization on the assigned channel within 90 seconds, the terminal shall return to the previous channel of operation.	II-21
276	5.6.1 (9)		None	If the terminal is switching form a 5-kHz DAMA channel to another 5-kHz DAMA channel, then the terminal shall retain all pending service requests it held in queue and shall not send a ROW:Login message on the new channel.	II-21
277	5.6.1 (10)		None	If the terminal is switching form a 5-kHz DAMA channel to a 25-kHz DAMA channel, then the terminal shall clear (i.e. delete) all pending service requests it previously held in queue.	II-21
278	5.6.1 (11)		None	After a terminal is reassigned to a new TDMA channel (5- or 25-kHz), it shall not return to the previous channel or change to any other channel unless directed to by the PCC.	II-21
279	5.6.2 (1)		None	While operating on a TDMA channel, the terminal shall change to a new channel only when directed to by the PCC.	II-15
280	5.6.2 (2)		None	The direction to change channels shall be by the FOW:Terminal Channel Assignment message.	II-15
281	5.6.2 (3)		None	The terminal shall change to the channel identified in the message.	II-15
282	5.6.2 (4)		None	If the Channel Type field is a one, the channel operates in the dedicated mode.	II-15
283	5.6.2 (5)		None	The terminal shall determine, based on the Channel field and Appendix D, whether the assigned channel is 5- or 25-kHz.	II-15
284	5.6.2 (6)		None	The channel shall be in accordance with MIL-STD-188-181.	II-15
285	5.6.2 (7)		None	The use of this channel shall be in accordance with 5.4.2.4.2.	II-15
	None	317	Appendix A	Each terminal shall be capable of receiving and interpreting each of the message fields defined in this appendix.	II-1, II-2 II-3, II-4
	None	318	Appendix B	Each terminal shall be capable of receiving and interpreting each of the messages defined in this appendix except for those defined in Tables B-III, B-XIII, B-XV, B-XVII, B-XVIII, B-XXI and B-XXIII through B-XXVI which are used by controllers.	II-1, II-2 II-3, II-4

188-182 Req #	MIL-STD-188-182 PARA	188-182A Req #	MIL-STD-188-182A PARA	REQUIREMENT DEFINITION	TEST
	None	319	Appendix C	Each terminal shall be capable of transmitting each of the messages defined in this appendix except for those defined in Tables C-3, C-4, C-12, C-13 through C-18,and C-20 which are used by controllers.	II-1, II-2 II-3, II-4
	None	320	Appendix D	Each frequency switching capable terminal shall be able to interpret the Channel field of the FOW:Terminal Channel Assignment message and automatically switch to the frequency as defined in this appendix.	II-15 II-21

APPENDIX D

DETAILED TEST PROCEDURES

D-1 LOGIN, REPORT STATUS, AND LOGOUT

1. Configure the equipment in the Single Footprint (SF), Single Channel (SC) configuration as depicted in Figure 1. Configure the satellite simulator frequencies for channel 151 from the Military Standard, and for 250 ms delay. For the purpose of all testing, the terminals under test will be designated Nodal Terminal (NT)1 and NT2.

2. Under Windows NT 4.0 at the Primary Channel Controller (PCC), click on the “Shortcut to Top Menu” icon. When the ViaSat warning comes up, click "OK".

3. At the PCC, configure all terminals to be used in the testing. On the "UHF 5 kHz/25 kHz Network Controller" screen, click on "Configuration" and on "Terminals". On the “Terminals” screen, click on “Edit” and “Add”. On the "Base Address Dialog" screen, type 1 in the box and click "OK". If the 25-kHz warning comes up, click "Yes". On the "Terminal New" screen, set the "Guard List Master" to "Terminal" and the "Role" to "Network Terminal". Click "Terminal Attributes" to bring up the second screen. Set the "Planned Home Channel" and "Home Channel" to "151". When all the settings are completed, click "OK" twice to close the screen.

4. Configure terminals 2 and 12999 using the same settings as for terminal 1. Configure terminals 3 and 10 with the same settings except set the "Role" to "Channel Controller". Configure terminals 100 through 107, 200, 201, 300, 301, 400, 401, 500 through 503, 600, 700, 800, 900, 1000 through 1005 and 2001 through 2005, using the same settings as NT1 except set the "Terminal Attributes screen to "Silent Terminal" and "Passive Ranging" and set the "C/No" to 50.

5. Configure all subnets to be used during the testing. On the "UHF 5 kHz/25 kHz Network Controller" screen, click on “Configuration” and on “Subnets”. Click on “Edit” and then “Add”, enter the subnet number, and click “OK”. Define subnets 16000, 16001, 20003, 20005, 20099, 20100, 30004, 32000, 32800, 32900 and 60003.

6. On the “UHF 5kHz/25kHz Network Controller” screen, click on “Configuration” then on “Modems”. On the “Modems” screen, click on "Add", enter "Modem Number" 1, and "Terminal Number" 3 for the PCC, then click "OK". Click on modem number 1 to highlight it and click on “View” then “Terminal Interface”. Close the “Modems” screen.

7. On the “ViaSat 5kHz Terminal Interface” screen, click on “Configuration” and “Communications”. Verify that the PC COM1 Port is specified as in-use. Click “Select/Initialize”.

8. On the “ViaSat 5kHz Terminal Interface” screen, click on “Configuration”, then on “Terminal”, and verify that the RT-1771/G is selected for “Radio Configuration”, verify that “Encrypt Orderwire” is not checked, “Passive Ranging” is not checked and “Modem Configuration” is set to Normal. Click “OK”.

9. On the “UHF 5 kHz/25 kHz Network Controller” screen, click “Configuration” then “Terminals”. Next click “5 kHz Networking” and “Service Request Queue”. On the “ViaSat 5 kHz Terminal Interface” screen, click on “File” and “Event Log”. On the “Event Log”, click on the double checkmark to clear the alarms, and arrange the screens for your viewing preference.

10. At the Alternate Channel Controller (ACC) computer, configure the ACC using the same settings as the PCC.

11. At the terminals under test, configure NT1 and NT2:

(a) Set the channel number or channel frequencies to the test channel.

(b) Assign terminal address 1 to NT1 and 2 to NT2.

(c) Assign subnet 30004 to the Guard List at both terminals.

(d) Set the transmit power to 4 watts.

(e) Set the terminals for active ranging.

(f) Set both terminals as AFC capable, unencrypted orderwires, and unencrypted data.

12. Connect three Bit Error Rate Test Sets (BERTS) into the network at the ACC, NT1 and NT2 as synchronous data sources.

13. At the PCC, clear the event log by clicking on the red X and answering “Yes” to the prompt. On the “ViaSat 5 kHz Terminal Interface” screen, click on “Commands” then “Initialize Modem”. Bring up the PCC by clicking on “Log In”. When the “Startup Frame Number” screen appears, click “OK”. Observe continuous Forward Order Wire (FOW) output and that the PCC is logged in on the “Terminals” screen. (Note: This will not occur instantly, as the PCC first monitors the link for four frames to see if there is another controller on the channel.)

14. At the ACC, log in the ACC. Observe that the ACC acquires, ranges, and executes log-in protocol, and that its status on the PCC “Terminals” screen is “Logged In”. Next, log in NT1 and NT2. Observe that the terminals acquire, range and execute log-in protocol, and that their status on the PCC “Terminals” screen is “Logged In”. When the terminals have logged in, stop the PCC log from scrolling by clicking on the blue arrow. Record the ROW:Login data, as reported in the PCC log, for each terminal.

15. Operate the network approximately three minutes. Request a status report from NT1 and NT2. On the “Terminals” screen at the PCC, highlight the terminal, click on “5 kHz Controls”, and click on “Query for Status Report”. Record the ROW:Status Report data for each terminal.

16. On the “ViaSat 5 kHz Terminal Interface” screen at the ACC, initiate a synchronous circuit data service request from Port 1 to subnet 30004. Set the “Destination” to 30004, the “Service Type” to “Data Circuit”, and click on “Initiate”. Observe on the PCC Event Log that the synchronous data service is assigned. Assert the Request To Send (RTS) on the ACC BERTS. Observe the NT1 and NT2 BERTS and record Input/Output (I/O) connectivity is established between the ACC and the subnet.

17. Log out NT1 manually from the PCC. Highlight the NT1 line on the “Terminals” screen. Click “5 kHz Controls” and “Login/Logout Terminal”.

18. Record that on the BERTS at NT1 I/O data reception is lost. Record continued I/O data reception at the BERTS connected to NT2. At NT1, record that the operator is notified/informed that the terminal is logged out.

19. Deassert RTS at the ACC Fireberd. At the PCC, highlight the service on the “Service Request Queue”, click on “Edit” and “Delete”, and click on “Yes” when the prompt appears.

20. Log out NT2 from the terminal. Verify from the PCC Event Log that NT2 outputs a ROW:Logout message (Message Type=6) and that the PCC outputs a FOW:Logout Response message (Message Type=7) indicating NT2 terminal requested log-out (Reason=0). Record the ROW:Logout data for the terminal.

21. Record at NT2 that the operator is notified/informed that the terminal is logged out.

22. At NT2, change the terminal address to 12999, delete guard list address 30004 and enter address 60003, and change to silent terminal.

23. Log in NT2. Observe that NT2 acquires and executes the Log-in Protocol. Record the data from the ROW:Log-in. Log-out the ACC over the air then change to Controller version c25-15e.

24. Disconnect the Intermediate Frequency (IF) input to the PCC so that the log-in attempt by NT1 will not be received. Log-in the ACC. Wait until the ACC has transmitted its ROW:Channel Controller Login twice without receiving a response from the PCC. This will allow the ACC to receive, but will stop the PCC from shutting down when its receive is disconnected.

25. Attempt to log in NT1. Observe on the ACC log and record the log-in failure on initial try and the retry. (Note: Some terminals may continue attempting to log in.) Record whether the terminal continues or notifies the operator that the log-in failed. Attempt to initiate a routine precedence Voice Circuit Request from NT1 to the ACC using default values for remaining parameters. NT1 should reject the request locally since the log-in protocol has not successfully completed. Record whether the terminal rejects the service.

26. Reconnect the PCC IF input. Log in the ACC.

27. Set NT1 address to 13000 (above demarcation, hence invalid).

28. Attempt to log in NT1. Record whether the terminal rejects the request locally since the address is above the Address Demarcation value or attempts to log-in. If the terminal attempts to log-in, record the operator notification that the log-in was unsuccessful.

29. Attempt to change NT1 address to zero; record whether the terminal rejects this address locally.

30. Attempt to enter address zero into NT1 Guard List; record whether the terminal rejects this action locally.

31. Set the NT1 Address to 12299 (same as NT2, hence invalid).

32. Log in NT1. Observe that terminal acquires and executes log-in protocol. Log-in response should contain a negative response code (Code=5; Rejected, invalid log-in address). Record if the operator is informed of the log-out. Record that NT2 does not log out as a result of the Login Response transmitted by the PCC.

33. Log out the NT2 from the terminal. Wait four to eight frames, record whether NT1 attempts log-in, then log out the ACC and take down the PCC.

(Write procedure for log out response messages 3 and 4.)

D-2 ADDRESS MANAGEMENT

1. Place equipment in the SF, SC configuration as depicted in Figure 1.

2. At the PCC and ACC, make sure both modems have I/O Port 1 set to "Synchronous, 2400 bps and Unencrypted Data". Set both controllers for encrypted orderwire. On the "ViaSat UHF DAMA Terminal Interface" screen, click on "Configuration" then on "Terminal". Click on "Encrypt Orderwire" to place an "x" in the box. Load cryptographic keys in both controllers. Connect the KYK-13 to the front of the modem and turn it on. Click on "Keys" then on "Load Key". When the "Select TRANSEC Key Position to Load" screen comes up, click on "Key Position 0" then click "OK". Next click on "Keys" and "Set Initial Key Position". When the "Select Initial TRANSEC Key Position" screen appears, click on "Key Position 0" and on "OK".

3. At the PCC, set the Channel Controller as Guard List Master for NT1. Define the Guard List for NT1 using the addresses in the PCC NT1 list in Table D-1. Define the Guard List for NT2 as listed under NT2 in Table D-1. At the ACC, define the Guard Lists for NT1 and NT2 as listed under their addresses in Table D-1.

Table D-1. Terminal Guard Lists

	NT1	NT2	PCC NT1 List
Terminal Address	**1**	**2**	
Guard List	100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 16000, 20100, 32000, 32800, 32900	101, 201, 301, 401, 501, 16001, 20099, 32000, 32800, 32900	102, 103, 104, 105, 106, 107, 1001, 1002, 1003, 1004, 1005, 2001, 2002, 2003, 2005

4. Configure NT1 and NT2 terminals using default values except define the Guard List at NT1 and NT2 using the values listed in their column of Table D-1. Input the addresses in NT2 in a random order, not as listed in the table. Set both terminals for encrypted orderwire and load Communications Security (COMSEC) key variable.

5. Bring up PCC. Observe continuous FOW output.

6. Log in ACC, NT1 and NT2. Observe that the ACC and terminals acquire, range, and execute log-in protocol. Record that the terminal address is seen on the range burst at the PCC when the terminals range.

7. Observe that the PCC transmits a FOW:Report Terminal Address to NT1 after receiving NT1's log-in. Observe ROW:Terminal Address Report and record the data for the first report from the terminal. Record that the PCC does not transmit a FOW:Report Terminal Address to NT2, indicating that the terminal correctly ordered the addresses for Cyclic Redundancy Check (CRC) calculation.

8. Observe that the PCC transmits FOW:Terminal Address Add or Delete to NT1 deleting all reported addresses and adding the addresses listed in the PCC NT1 list. Record that NT1 responds with ROW:Terminal Address Add or Delete Response to all transmitted FOWs. Record the data for the first response deleting an address and the first response adding an address.

9. Log out NT1. At the PCC, change the Guard List Master for NT1 to Terminal. Log in NT1. Observe that the PCC transmits a FOW:Report Terminal Address to NT1 after receiving NT1's log-in. Observe ROW:Terminal Address Report from NT1.

10. Record at PCC, ACC, NT1, and NT2 that the post-log-in guard lists match pre-log-in guard lists.

11. At NT1, initiate a circuit data service to subnet 32000. When the circuit is established, start FIREBERD as data source at NT1. Record I/O connectivity between NT1, NT2, and ACC.

12. From PCC, double click on the NT2 line on the “Terminals” screen. Click on the arrow on the “Guard List” portion of the screen. Highlight address 32000, click “Delete” and “OK”. This deletes subnet 32000 from the NT2 Guard List.

13. Observe FOW:Terminal Address Add or Delete on PCC Event Log sent to terminal 2.

14. Observe the ROW:Terminal Address Add or Delete Response received at the PCC.

15. Record loss of I/O connectivity between NT1 and NT2.

16. Record I/O connectivity remains between NT1 and ACC. Deassert RTS at NT1.

17. Record NT2 Guard List Database no longer contains subnet 32000. Teardown the subnet service from NT1.

18. At the PCC, request a status report from NT2. Record the Guard List CRC from the ROW:Terminal Status Report.

19. From the PCC, add subnet 32000 to NT2 Guard List. Follow the same instructions as deleting an address, but type the address in the Guard List window, click “Add” and then “OK”.

20. Observe FOW:Terminal Address Add or Delete on PCC Event Log.

21. Record ROW:Terminal Address Add or Delete Response.

22. Record added address is contained in NT2 Guard List database.

23. Log out NT2. At PCC, change NT2 to “not authorized to log-in”. Double click on the NT2 line on the “Terminals” screen, and click on the “Authorized” block to remove the “x”.

24. Log in NT2. Observe NT2 acquires and executes the log-in protocol. Observe PCC transmits a FOW:Log-out Response (Reason=2 meaning “Not authorized”). Record that the terminal notifies the operator that the log-in was not successful, and the reason for the log-in denial.

25. Log out NT1 and the ACC. Initialize the PCC.

26. Begin Phase 2 of the test.

27. Bring up the Diagnostic Modem Control Unit (DMCU) acting as the PCC. Log in ACC. Remotely login NT1 and NT2.

28. Use DMCU script PRADM01.MCS to generate FOW:Terminal Address Add or Delete orderwire for the ten cases shown in Table D-2. For each case observe the ACC event log depicts the appropriate FOW and corresponding Return Order Wire (ROW) for each action.

29. Record that the NT2 Guard List is empty, and that the NT1 Guard List does not contain address 200.

30. Manually log out NT1, NT2, and the ACC. Bring down DMCU.

Table D-2. DMCU Script Actions

Action No	DMCU Action	MIL-STD-188-182A Expected Response	MIL-STD-188-182 Expected Response
1	add address 102 to NT1 guard list	NT1 reports an address add failure (2)	NT1 reports an address add failure (2)
2	add existing address to NT1 guard list (100)	NT1 reports address added (0)	NT1 reports an address add failure (2)
3	add new address to NT2 guard list (202)	NT2 reports address added (0)	NT2 reports address added (0)
4	add existing address to NT2 guard list (101)	NT2 reports address added (0)	NT2 reports an address add failure (2)
5	delete an invalid address from NT1 guard list (105)	NT1 reports address deleted (1)	NT1 reports address delete failure (3)
6	delete a valid address from NT1 guard list (200)	NT1 reports address deleted (1)	NT1 reports address deleted (1)
7	delete an invalid address from NT2 guard list (105)	NT1 reports address deleted (1)	NT2 reports address delete failure (3)
8	delete a valid address from NT2 guard list (301)	NT2 reports address deleted (1)	NT1 reports address deleted (1)
9	delete all address from NT2 guard list	NT2 reports addresses deleted (1)	NT1 reports address deleted (1)
10	delete address from empty NT2 guard list (500)	NT1 reports address deleted (1)	NT2 reports address delete failure (3)

D-3 MESSAGE SERVICE OPTIONS

1. Place equipment in SF, SC configuration as depicted in Figure 1.

2. Configure PCC and ACC using default values except:

   (a) Set port 1 to asynchronous, unencrypted, message service.

   (b) Adjust the terminal C/No to the level on the data sheet for the first trial. To do this, double click on the terminal address line on the “Terminals” screen. At the “Link Quality” window, type the required value in both the “Upper Limit” and “Lower Limit” windows and click “OK”.

3. Configure NT1 and NT2 using default values except:

   (a) Modify NT1’s guard list to include 1001, 1002, 1003, 1004, 1005.

   (b) Modify NT2’s guard list to include 2001, 2002, 2003, 2004, 2005.

   (c) Add subnet 60000 to the terminal Guard Lists.

   (d) Set the port for asynchronous input.

4. Bring up PCC. Observe continuous FOW output.

5. Log in ACC, NT1 and NT2. Observe that terminals acquire, range, and execute log-in protocol.

6. Initiate a message, PREC: Routine, Globabl Search-On, service from NT1 to the ACC and transmit "msg50.txt" specifying unencrypted data. Record the data for the ROW:Message Setup.

7. Observe message transfer complete and record correct reception of the message at the ACC.

8. Repeat steps 6 and 7 for the remaining modulation rates and coded conditions listed in the table. The rates that are only applicable to MIL-STD-188-182A are designated by an asterisk on the table. Request the second message from the ACC to NT1. To request this service, on the “Terminal Interface” screen, “I/O Port 1" window, set the “Destination” to 1, “Service Type” to “Message”, and click on “Initiate”. Initiate the message transfer from the PC.

9. Once the message begins, record the data for the first ROW:Block Acknowledgement from the terminal. Upon completion of the message, record the data for the ROW:Message Acknowledgement. After the second message, the rest of the messages can be transmitted between the terminals under test.

10. After all modulation rates have been tested, request a message from the ACC to address 60000 and transmit "msg100.txt". Allow the message to complete and verify correct reception of the message at NT1 and NT2. Record that all burst rates are supported.

11. At the PCC, establish a preassigned circuit between NT1 and NT2. This will result in the queuing of the subsequent message services. If the terminal is a single port terminal, establish the circuit between two dummy terminals, 1 data circuit 2400 Kbps and 1 data circuit 75 Kbps.

12. At NT1, request a series of five message services to NT2 using the unique guard list addresses, in ascending order, associated with NT2 for the destination address and unique precedence values (from ROUTINE to FLASH OVERRIDE) for each message. Transmit "msg10.txt" for the first three addresses, "msg25.txt" for the Flash precedence, and "msg50.txt" for the Flash Override precedence.

13. Allow NT1 to generate all ROW:Message Setup messages, and the PCC to respond with FOW:Message Setup Response messages. Record the virtual port identification value included in the ROWs (from the PCC event log entries). Record that NT1 indicates a queued message setup for each of the five messages.

14. At NT2, request a series of five message services to NT1 using the unique guard list addresses, in ascending order, associated with NT1 for the destination address and unique precedence values (from ROUTINE to FLASH OVERRIDE) for each message. Transmit "msg10.txt" for the first three addresses, "msg25.txt" for the Flash precedence, and "msg50.txt" for the Flash Override precedence.

15. Allow NT2 to generate all ROW:Message Setup messages, and the PCC to respond with FOW:Message Setup Response messages. Record the virtual port identification value included in the ROWs (from the PCC event log entries). Record that NT2 indicates a queued message setup for each of the five messages.

16. Observe that the PCC's Service Request Queue contains the ten queued message services (with a status of Source Busy).

17. At NT1, attempt to initiate a new message service to terminal 2001. Record that NT1 does not create a ROW:Message Service Setup, but instead reports the lack of available virtual port ids.

18. At the PCC, teardown the IMMEDIATE precedence service from NT1. On the "Service Request Queue", click on the service, click "Edit" and "Delete" and click on "Yes" at the prompt. Record a notification at NT1 of the NCS operator teardown.

19. Log out the ACC over the air. Disconnect the PCC IF input. Log in the ACC using c25-15e, change modem address to 10 and wait until the ACC is receiving FOWs and ROWs. At NT1, attempt to generate a new message service to terminal 2003. Allow the terminal to complete the contention ROW protocol (one retry). Record a notification at NT1 indicating the message setup failure.

20. At NT1, attempt to generate a new message service to terminal NT2 (using address 2). After NT1 transmits its first ROW:Message Setup, reconnect the PCC IF input. Allow the terminal to complete the contention ROW protocol (one retry). Record the ROW:Message Setup Retry Flag value. Observe the new service in the PCC's Service Request Queue.

21. From NT1, teardown the routine message service from NT1 to 2001. Record the ROW:Message Teardown data.

22. From the PCC, teardown all queued services except for the Flash and Flash Override services.

23. At the PCC, teardown the preassigned voice service. Observe the FLASH OVERRIDE message service sourced by NT1 become active. Allow the message service protocol to run until completed. Record correct reception of the message at NT2.

24. Observe the FLASH OVERRIDE message service sourced by NT2 become active. Allow the message service to run until completed. Record correct reception of the message at NT1.

25. Observe the FLASH message service sourced by NT1 become active. Allow the message service protocol to run until completed. Record correct reception of the message at NT2.

26. Observe the FLASH message service sourced by NT2 become active. Allow the message service to run until completed. Record correct reception of the message at the NT1.

27. In sequence, set up message services as indicated in the table below, using default values for the remaining parameters. Initiate transmission of "msg100.txt" from NT1 to destination indicated in the table.

Table D-3. Teardown Cases

Trial	Source	Destination	Teardown From	Expected Result
1	NT1	NT2	NT1	successful
2	NT1	NT2	NT2	successful
3	NT1	60000	NT2	not possible
4	NT1	60000	NT1	successful

28. While service is active, initiate teardown from the indicated terminal.

29. Record the result (including communications (COM) Burst Type from the PCC log) of the teardown attempt.

30. From NT1, transmit "msgmax.txt" to NT2. Record correct reception of the message at NT2.

31. Attempt to transmit "msgmax1.txt" from NT1 to NT2. Record notification to operator of message length being too long. (Some terminals send partial messages, some do not transmit the message.)

32. Log out the ACC, NT1 and NT2. Take PCC down. Configure the I/O ports for NT1 and the PCC for encrypted synchronous input. Connect the (Automatic Data Controller) ADC and computers running Data Terminal Service Windows to the terminal and to the PCC.

33. Log in the PCC and observe continuous FOW output.

34. Log in NT1 and observe the terminal acquires the network and logs in.

35. From NT1, request an encrypted message service to the PCC and transmit "msg50.txt". Observe that the message service is assigned. Let the message service protocol complete. Verify and record correct reception of the message at the PCC.

36. From the PCC, request an encrypted message service to NT1 and transmit "msg50.txt". Observe that the message service is assigned. Let the message service protocol complete. Verify and record correct reception of the message at NT1.

37. Log out NT1, take PCC down.

38. Bring up DMCU running “prstd01” script. Observe continuous FOW output. Script runs 20 frames (about 3 minutes) before FOWs containing assignments start.

39. During the first three minutes of DMCU operation, log in ACC over the air and NT1 and NT2 remotely. Observe that terminals acquire.

40. In sequence, the DMCU script will set up services as indicated in the table below. For each trial, the DMCU will repeat the assignments for 20 frames, during which time automatic teardowns will occur.

Table D-4. DMCU Teardown Cases

Trial	Services	Notes	Service State	Teardown Expected From
1	Msg. T1 to T2	Not known to T1.	Active	T1
2	Ckt. T1 to T2 Msg. T1 to 20006	PREASS FLASH	Active Active	-- T1
3	Ckt. T1 to T2 T2 to PCC	PREASS ROUTINE	Active Active	-- T2

41. Observe DMCU script run for at least 90 frames total (after which DMCU will continue to send nominal FOWs, containing only System Messages). Record whether teardowns were seen as expected.

42. Log out ACC, NT1, and NT2. Take DMCU down.

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D-4 CIRCUIT SERVICE OPTIONS

1. Place equipment in SF, SC configuration as depicted in Figure 1.

2. Configure PCC and ACC using default values except add subnet 20005 to the ACC, NT1 and NT2, and set the data port to synchronous data. Connect a FIREBERD to port one of the ACC and an ANDVT to port 2. Configure port 2 for encrypted synchronous voice. Load crypto key into the ANDVT.

3. Configure NT1 and NT2 using default values. Set the data port for synchronous data. Connect a FIREBERD to each data port. If the terminal does not embed COMSEC, connect an ANDVT to the voice port. Set the port for encrypted, synchronous voice. Load crypto key into the ANDVT or into the terminal if it embeds COMSEC.

4. Bring up PCC. Observe continuous FOW output.

5. Log in ACC, NT1 and NT2. Observe that terminals acquire, range, and execute Log-in protocol.

6. Set the C/No for the ACC and to the level on the data collection sheet for the first trial. Establish a preassigned circuit service between the ACC and NT1. Services only applicable to MIL-STD-188-182A compliant terminals are designated by an asterisk on the data collection sheet. At the PCC, on the “USAF UHF 5 kHz Network Controller” menu, click on “Networking” and “Preassigned Services”. To initiate a preassigned synchronous circuit service, click on “Service” and “Add”. On the “Preassigned Service” screen, enter the “Source Terminal” and “Destination” addresses. Click on “Encrypted Data” to remove the “x”. Click on “Service Parameters” and set the “Baud Rate” based on the service required from the data collection sheet. Click on “Full Duplex” or “Half Duplex” and “Synchronous”. Click “OK” and then “OK” on the “Preassigned Service” screen. When the PCC establishes the circuit, enable Request To Send (RTS) at the FIREBERD at the source terminal.

7. Allow circuit service to run for four frames after the receiving FIREBERD achieves synchronization. Deassert RTS at the source terminal, allow the data to flush from the buffers, and assert RTS at the destination terminal. Allow circuit service to run for four Frames after the receiving FIREBERD achieves synchronization.

8. Highlight the circuit service on the “Preassigned Services” screen at the PCC, click “Service”, “Delete”, and “YES”. Observe FOW:Circuit Teardown occurs.

9. Repeat steps 6-8 for each of the remaining test cases. When the I/O rate changes to 1200 bps, establish the circuits between NT1 and NT2. When the I/O rate changes to 300 bits per second, log out NT1 and NT2, change the port to asynchronous service, and log the terminals back in. Complete the table using asynchronous data. Record that all rates, synchronous and asynchronous data are supported.

10. Set the C/No for NT1 and the PCC to obtain the first symbol rate for a voice circuit. From NT1, request a half-duplex voice circuit to the PCC. From NT1, request a half-duplex voice circuit to the PCC. Once the circuit is assigned, transmit from NT1 to the PCC, then from the PCC to NT1. Teardown the circuit.

11. Repeat step 10 for the other symbol rates. Record on the data sheet all rates that operate correctly. Once all rates have been completed, record that all voice rates are supported by the terminal.

12. When testing a MIL-STD-188-182A compliant terminal, log in a MIL-STD-188-182 compliant terminal as terminal 100. Using the C/No for the MIL-STD-188-182 symbol rates, establish a voice service between the two terminals. Once the circuit is assigned, transmit from NT1 to terminal 100, then from terminal 100 to NT1. Teardown the circuit.

13. Repeat step 12 for the other symbol rates. Record on the data sheet all rates that operate correctly. Once all rates have been completed, record that all voice rates are supported by the terminal.

14. For MIL-STD-188-182A compliant terminals, set the C/No for NT1 and the PCC to 42. This will cause the controller to assign a 3000 sps, half-rate coded service. From NT1, request a half-duplex voice circuit to the PCC. Observe that the service is assigned.

15. At NT1, key the terminal and transmit for more than 10 seconds. This will cause the transmission to end in the middle of the communications slot and will cause the terminal to generate the over code. Record that the ANDVT connected to the controller receives the transmission correctly.

16. At NT1, key the terminal 2 seconds after the FOW is seen on the spectrum analyzer. This will start the transmission during the slot and will cause the terminal to generate prefill bits. Record that the ANDVT connected to the controller receives the transmission correctly. Teardown the voice circuit.

17. For all terminals, request a circuit service (routine precedence, 2400 bps, unencrypted data, global search on) from NT1 to NT2. Record the data for the ROW:Circuit Setup. Observe service is active from the PCC Service Request Queue.

18. Teardown the circuit from NT1. Record Communications (COM) Burst Type 2 transmitted from the terminal. Observe that the circuit is torn down.

19. Request a circuit service from NT1 to NT2. Observe service is active from the PCC Service Request Queue.

20 Teardown the circuit from NT2. For MIL-STD-188-182 compliant terminals, record COM Burst Type 2 transmitted from the terminal. For MIL-STD-188-182A compliant terminals record that the terminal transmits a ROW:Circuit Service Teardown. Observe that the circuit is torn down.

21. For MIL-STD-188-182 compliant terminals, request a circuit service with NT1 as the source terminal and NT2 as the destination terminal. Assert RTS at the BERTS at NT1. Once the BERTS at NT2 is synchronized, teardown the circuit from NT2. Record that after four frames with the controller reporting COM Burst Type 3, a ROW:Circuit Teardown is transmitted and observe that the circuit is torn down.

NOTE: Reduce the carrier level on Terminal N2 by 3dB.

22. For MIL-STD-188-182A compliant terminals, request a circuit service with NT1 as the source terminal and NT2 as the destination terminal. Assert RTS at the BERTS at NT2. Once the BERTS at NT1 is synchronized, teardown the circuit from NT1. Record that after four frames with the controller reporting COM Burst Type 3, a ROW:Circuit Teardown is transmitted and observe that the circuit is torn down.

23. Setup a circuit service with NT1 as the source terminal and subnet 20005 as the destination. Observe service is active from the PCC Service Request Queue.

24. Attempt to teardown the circuit from NT2. Record COM Burst. Observe that the circuit is not torn down.

25. Teardown the circuit from NT1. Record COM Burst Type 2 is transmitted from the terminal. Record that the circuit is torn down.

26. Setup a circuit service with NT1 as the source terminal and Subnet 20005 as the destination. Then, setup a circuit service with NT1 as the source terminal and NT2 as the destination. Observe from the PCC Service Request Queue that the NT1 to NT2 service is queued local.

27. Attempt to teardown the queued circuit from NT2. Record that the circuit is not torn down.

28. Teardown the queued circuit from NT1. Observe ROW:Circuit Teardown transmitted from NT1 and record the data. Record that the circuit is torn down. At the PCC, teardown the subnet circuit.

29. Setup a preassigned circuit service with NT1 as the source terminal and NT2 as the destination. Observe service is active from the PCC Service Request Queue.

30. Attempt to teardown the circuit from NT1. Observe COM Burst Type. Record that the circuit is not torn down.

31. Teardown the circuit from PCC.

32. At the PCC, on the “UHF 5KHz/25kHz Network Controller” screen, click on “Networking” and “System Parameters”. In the “Unused Service Timeout” box, change the number to 20 then click “OK”.

33. Establish a circuit from NT1 to NT2 using default settings. Allow the circuit to remain assigned, but do not transmit data, for 20 frames.

34. When the PCC tears down the circuit, verify and record that both terminals notify the operator of the teardown.

35. At the PCC, change the Unused Service Timeout back to 200 frames.

36. Log out ACC, NT1 and NT2. Take PCC down.

37. The next steps will test automatic teardown of circuits. Because the service combinations used are not legitimate, the PCC will not support this test. Utilize the DMCU to generate FOW assignments which match the required circuit service combinations. For each combination, observe that the expected automatic teardown scenario occurs. Because the DMCU is not capable of processing the end-of-service Burst Type, NT1 and NT2 will utilize the ROW:Circuit Teardown orderwire.

38. Bring up DMCU running “prstd02” script. Log-in ACC. Manually Log-in NT1 and NT2 at ACC and Log-in NT1 and NT2 remotely at each terminal.

39. The script will setup a circuit service with NT1 as the source terminal and NT2 as the destination. The service will become active, and the DMCU will start sending FOW:Circuit Assignments.

40. Record that NT1 tears down the circuit, as it is an unknown service. Observe ROW:Circuit Teardown message (Reason 9).

41. The script will setup a pre-assigned circuit service with NT1 as the source terminal and NT2 as the destination. Then it will setup a circuit service with PCC as the source terminal and NT1 as the destination, with precedence of ROUTINE.

42. Observe service is active. Record NT1 tears down the circuit. Observe ROW:Circuit Teardown message (Reason 5 or Reason 6).

43. The DMCU will setup a preassigned circuit service with NT2 as the source terminal and NT1 as the destination. It will then setup a circuit service with NT2 as the source terminal and PCC as the destination, with precedence of ROUTINE. Observe each service is active.

44. Record NT2 tears down the circuit. Observe ROW:Circuit Teardown message (Reason 9).

45. Log out the ACC, NT1 and NT2.

46. Stop the DMCU.

47. Bring up the DMCU running the "prmh" script. Log-in the ACC using e25-15e Controller Address to 3.. Manually Log-in NT1 at ACC and Log-in NT1 remotely at the terminal.

48. In frame 1019 of the script, request a circuit service from NT1 to NT2 (routine precedence, unencrypted data, global search on 2400 bps).

NOTE: For this test, the Service Request must use Virtual Port 0 for the script to work correctly.

49. In frame 1021, the DMCU will assign a multiple-hop circuit service with NT1 as the source and the PCC as the destination. Record that the terminal accepts the assignment and does not teardown the service.

50. In frame 1033, the DMCU will teardown the service. Record that the terminal notifies the operator of the teardown.

51. In frame 1040, the DMCU will assign a multiple-hop circuit service with the PCC as the source and NT1 as the destination. Record that the terminal accepts the assignment and does not teardown the service.

52. In frame 1050, the DMCU will teardown the service. Record that the terminal notifies the operator of the teardown.

53. Log out the ACC and NT1.

54. Stop the DMCU.

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D-5 BURST TYPE DETERMINATION

1. Place equipment in SF, SC configuration as depicted in Figure 1.

2. Configure PCC and NT1. Use default configuration values.

3. Bring up PCC. Observe continuous FOW output on Event Log.

4. Log in NT1. Observe that terminal acquires and performs log-in protocol.

5. Use the NCS memory access poke command to insert errors into the burst type field lookup table for the Start-of-Frame (SOF) burst type. On the “ViaSat UHF 5 kHz Terminal Interface” screen, click on “Commands” and “Memory Access”. In the “Poke” box of the “Memory Access” screen, type the address “0xd749”. Under the “Value” box, type the “Value to Modify to” from Table F-5 for Test Case 1, and click on “Write Value”. Verify that FOWs are received at NT1.

Table D-5. Start-of-Frame Burst Type Field I-Q Modifications

Test Case	Original Burst Type	Bit Errors Inserted	Modify Value To:	Expected Result
1	SOF (0000)	1	0400	FOW
2	SOF (0000)	2	0600	FOW
3	SOF (0000)	3	0680	FOW
4	SOF (0000)	4	06C0	Missed FOW/ FOW
5	SOF (0000)	5	06D0	Missed FOW
6	SOF (0000)	6	06D8	Missed FOW
7	SOF (0000)	7	06DA	Missed FOW
8	SOF (0000)	8	04DB	Missed FOW

6. Repeat step 5 for test cases 2 through 8. Record whether the expected outcome (as listed in Table) of each test case is observed. When the terminal misses FOWs, the test will be stopped and the data recorded.

7. Write the value “0000" into the memory address, and close the “Memory Access” screen.

8. Log out NT1. Take PCC down.

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D-6 FOW DROPOUT

1. Place equipment in SF, SC configuration as depicted in Figure 1.

2. Configure PCC and NT1. Use default configuration values.

3. Bring up PCC. Observe continuous FOW output.

4. Log in NT1. Observe that terminal acquires and executes Log-in protocol.

5. Initiate a 2400 bps synchronous circuit data service request from NT1 to PCC. Observe on PCC event log that the service is assigned.

6. Assert RTS on the FIREBERD connected to NT1. Verify that synchronization is achieved on the FIREBERD connected to the PCC.

7. Disconnect the receive of NT1 to achieve loss of FOW signals, and note the current frame number. Verify loss of synchronization on FIREBERD and loss of FOW at NT1. Deassert RTS on FIREBERD at NT1. Continue in this state until approximately 20 FOWs are missed by NT1.

8. Connect NT1 receive to resume reception of FOW signals. Reassert RTS on the FIREBERD at NT1. Record resumption of data transmission by re-synchronization of the FIREBERD at the PCC.

9. Disconnect receive of NT1 to again produce a loss of FOW, and note the current frame number. Observe that after 200 consecutive frames where no FOW is received by NT1, the terminal will report the 200 missed FOWs event and will automatically log-out at the terminal.

10. Take PCC down.

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D-7 CONTENTION ROW MESSAGE

1. Place equipment in SF, SC configuration as depicted in Figure 1.

2. Configure PCC using default values.

3. Configure ACC and NT1. Use default values.

4. Bring up PCC. Observe continuous FOW output.

5. From PCC, set ROW Backoff Number to value “60”. On the USAF 5KHz Network Controller screen, click on "Networking" and on "Controlled DAMA/TDMA Channels". Once the screen opens, highlight the channel you are using and click on "Controls" and "ROW Backoff Number". Set the control to manual and click on 60. Since in a quiet frame there should be approximately 30 contention ROW message slots, using 60 will increase the likelihood that the terminal will retry in a frame other than the very next one.

6. Disconnect the PCC IF input.

7. Log in ACC. Observe that terminal acquires, ranges, and executes Log-in protocol but does not receive Log-in response from the PCC. The ACC will then continue to monitor the downlink..

8. Attempt to Log-in NT1. The terminal will either attempt to log in twice and notify the operator that the login failed, or will continue to attempt to log in. Record either the operator notification or continued login attempts.

9. Reconnect the PCC IF input.

10. If the terminal is still attempting to log in, record that NT1 terminal successfully executes Log-in protocol. If not, log in NT1.

11. Disconnect the PCC IF input.

12. Initiate a circuit data service request from NT1 to ACC using default parameters. Record request failure, a single retry, and NT1 notification to operator.

13. Reconnect the PCC IF input.

14. Log out NT1. Shut down PCC.

15. Use ACC event log to determine the actual slot in which all transmissions occurred. Record whether the ROWs are transmitted in random slots.

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D-8 NETWORK ENTRY AND ROLLOVER

1. Place equipment in SF, SC configuration as depicted in Figure 1.

2. Configure the PCC using default values. Set for orderwire encryption.

3. Configure ACC, NT1, and NT2 using default values. Set for orderwire encryption.

4. At the PCC and ACC, proceed to load six keys into the modem. Follow the directions in test F-2, but, after loading the first key, click on "Key Position 1", change the KYK-13 to position 2 and click on “OK”. Continue implementing the number of the key position and the KYK-13 key each time until all six positions are filled. Click on “Status” and “Keys” to verify that all six keys have been loaded.

5. Set the initial network key on the PCC to be key 0.

6. On NT1 and NT2, proceed to load key positions 0, 1, 2, 3, 4 and 5. Verify that all of these 6 keys have been loaded. If the initial key cannot be set, load key 1 into position 6 instead of into position 0.

7. Bring up PCC. Observe continuous FOW output.

8. Log in the ACC and NT1. Observe that terminals acquire and execute Log-in protocol using the encrypted FOWs.

9. Set the initial key on NT2 to be key 2 (if the key is able to be set).

10. Log in NT2. Record that despite the initial key setting being different than the network key, the terminal correctly acquires the network, ranges, and executes log-in protocol.

11. At the PCC, initiate network key rollover from key 0 to key 3. On the "ViaSat Terminal Interface" screen, click on "Keys" then on "Rollover Setup". Click on the box next to the 3, then click on "Update Next Key Value", then click on "Start Rollover". When the alert comes up, click on "Yes". Observe on PCC Event Log the FOW:Next Key Indicator message in four successive frames followed by the FOW:Time Slot Change Countdown Indicator message in four consecutive frames.

12. After the fourth frame, the key rollover should be complete. Frame count should be reset to one as a result.

13. Request a status report from NT1 and NT2 and record that both terminals respond with a ROW:Terminal Status Report.

14. On the PCC, initiate network key rollover from key 3 to key 1.

15. After the fourth frame, the key rollover should be complete. Frame count should be reset to one as a result.

16. Request a status report from NT1 and NT2 and record that both terminals respond with a ROW:Terminal Status Report.

17. Log NT1 off the network. Configure the Terminal to bypass orderwire encryption. Attempt to log NT1 onto the network. Record denial of network services due to invalid key.

18. Log out the ACC and NT2, shut down the PCC.

19. Set the initial key on PCC, ACC, NT1, NT2 to be key 4.

20. At the PCC, click “Log In”. When the log-in screen appears, check “Operator Specified” and set the initial frame count to 1048526 (2^{20} - 50). Click “OK”. Observe continuous FOW output.

21. Log in ACC and NT1. Observe that terminals acquire and execute Log-in protocol using the encrypted FOWs.

22. On the PCC, set the next key for rollover to be key 2. Follow the instructions in step 11, but do not click on "Start Rollover". After the key has been selected, click "OK" to close the screen.

23. At frame number 1048567 (2^{20} - 9) verify that the PCC initiates an automatic rollover by observing on the PCC event log that the FOW:Next Key Indicator message is given in four successive frames followed by the FOW:Time Slot Change Countdown Indicator message in four consecutive frames.

24. Log in NT2 after the four frames with the FOW:Next Key Indicator message are received at NT2, but before the key rollover is complete.

25. Observe that the rollover is complete at the reset frame count of 1. Request a status report from NT1 and NT2 and record that both terminals respond with a ROW:Terminal Status Report.

26. For MIL-STD-188-182A compliant terminals, transmit the zeroize command to NT2. On the "Terminals" screen, highlight NT2. Click on "Controls" and then on "Zeroize Terminal". Record that NT2 zeroizes the keys in the terminal and informs the operator that the keys were zeroized.

27. Check the key status on NT1. Since the previous key rollovers zeroized the previously used keys, record that only keys 2, 3 and 6 (1, 2 and 5 if the terminal starts with key position 0) remain. If the terminal does not have a screen to check keys, reload key 0 into the PCC. Initiate a key rollover with key 0 selected for the next key. Record that the terminal stops receiving FOWs, as this key was deleted after it was used.

28. Log out the ACC and NT1. Take down the PCC.

29. (MIL-STA-188-182A Test) Bring up the DMCU running the script "przero.mcs". NOTE: This test is run with Encrypted Orderwire. Log in NT1 remotely. In frame 108 run an Encrypted OW, the controller will send a Zeroize command to NT1 with incorrect addresses. Record that the terminal ignores the command and continues operation. Log out NT1 and shut down the DMCU.

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D-9 TERMINAL/SYSTEM RESTRICTIONS

1. Place equipment in SF, SC configuration as depicted in Figure 1.

2. Configure PCC using default values except: Set NT1 Terminal Access Restriction to Immediate and NT2 Terminal Access Restriction to Flash. On the “Terminals” screen, double-click on the terminal number. On the “Terminal 1" screen, use the arrow next to the “Access Restriction” window to set to the correct precedence. Then click “OK”.

3. Configure ACC, NT1, and NT2 using default values.

4. Bring up PCC. Observe continuous FOW output.

5. Log in ACC, NT1, and NT2. Observe that terminals execute Log-in protocol.

6. Record the Terminal Access Restriction values received by NT1 and NT2.

7. Initiate a circuit data service request at precedence FLASH from NT1 to NT2 using default values for remaining parameters. Record that the NT1 operator is notified that the service is “rejected, Terminal Access Restriction (TAR) violation”.

8. Initiate a circuit data service request at precedence PRIORITY from NT1 to NT2 using default values for remaining parameters. Record on PCC Service Request Queue window that service is successfully queued and activated.

9. Teardown the circuit.

10. Initiate a voice circuit at 2400 bps, precedence routine from NT1 to NT2. Record circuit is assigned.

11. Teardown the circuit.

12. At the PCC, change System Access Restriction to priority. On the “USAF UHF 5kHz Network Controller” screen, click on "5 kHz Networking" and on “Controlled DAMA/TDMA Channels”, highlight the channel and click on "Controls" and “Channel Restrictions”. Use the arrow next to the “Channel Access Restriction Level” window to change to priority. Click on “OK”.

13. Wait for four frames, then initiate a voice circuit at 2400 bps, precedence routine from NT1 to NT2. Record that the terminal rejects the request locally, and that the operator is notified.

14. At the PCC, change System Service Restriction to “on”. On the “UHF 5kHz Network Controller” screen, click on "5 kHz Networking" and on "Controlled DAMA/TDMA Channels", “Controls” and on “Channel Restrictions”. Click the box next to “Channel Service Restriction” and click on “OK”.

15. Wait four frames, then initiate a voice circuit at 2400 bps, precedence Immediate from NT1 to NT2. Record that the terminal rejects the request locally, and that the operator is notified.

16. Log out ACC, NT1, and NT2. Take PCC down.

D-10 TERMINAL NETWORK TRANSITION PROTOCOL

1. Place equipment in the SF, SC configuration as depicted in Figure 1.

2. Configure PCC and ACC using default values.

3. Bring up PCC. Observe continuous FOW output. Log-in ACC.

4. Manually log-in terminals101 through 107 at both PCC and ACC.

5. Log-in NT1 and NT2. Observe that terminals acquire and execute Log-in protocol.

6. Initiate five (5) circuit data services from NT1 to simulated terminals, with a mix of active and queued services. Setup NT1 to 101 (Flash Override; 300 bps), 104 (Flash; 300 bps), 105 (Immediate; 300 bps), 106 (Priority; 300 bps), 107 (Routine; 300 bps).

7. Initiate two (2) circuit data services from NT2 to simulated terminals, one active and one queued. Setup NT2 to 102 (Flash Override; 300 bps), NT2 to 103 (Priority; 300 bps).

8. Log-out the PCC, using the “Transition Control to the ACC” option, to accomplish a manual network transition from PCC. Allow transition to complete.

9. Observe FOW:Participant Status Data Base orderwire messages were output by the “new” PCC.

10. Record whether NT1 and NT2 each notified the respective terminal operator of the transition.

11. Record whether the service count from each terminal is correct.

12. Observe that the services were reactivated as they were assigned prior to the transition, and record that terminals reflect the services in their service queue.

13. Disconnect the receive path of NT1 to disable FOW reception.

14. At the PCC, teardown two of the queued services involving NT1, which will leave NT1 with three services.

15. After the FOW:Circuit Teardown messages are transmitted by the PCC, re-connect the receive path at NT1.

16. Log-out the PCC, using the “Transition Control to the ACC” option, to accomplish a manual network transition from PCC.

17. Manually log out NT2 at the ACC prior to it becoming the PCC. Allow transition to complete.

18. Observe FOW:Participant Status Data Base orderwire messages output by the “new” PCC.

19. Record whether NT1 and NT2 each notified the respective terminal operator of the transition.

20. Record that the service count is incorrect for NT1 and whether the terminal notifies the operator.

21. Record whether NT1 resubmits services to PCC.

22. Observe that the PCC responds to each service request from NT1.

23. Observe NT2 receives FOW:Participant Status Data Base orderwire message, but is not included in the orderwire.

24. Record NT2 transitioned to a logged out state and that the NT2 operator is notified of the log-out and cause or that the terminal automatically logs back in.

25. Log-in NT2 if it did not log back in automatically.

26. At the PCC, on the “ViaSat UHF DAMA Terminal Interface” screen, click on “Commands” and “Initialize Modem”. This will cause an automatic take-over by the ACC after three frames with missed FOWs.

27. Disconnect the receive path at NT2 and leave it disconnected until after the FOW:Participant Status Database has been transmitted by the PCC.

28. Record whether NT1 acquires the FOW and receives the FOW:Participant Status Database.

29. Reconnect NT2s receive. When the terminal receives the FOW but does not receive the FOW:Participant Status Database, it will either transition to a logged-out state or will transmit a ROW:Login. Record the terminal action.

30. Log out NT1 and NT2. Take PCC down.

31. If the terminal cannot follow the transition in the previous steps, bring up the DMCU and start the script “PCCTRAN2.MCS”.

32. Remotely log-in the ACC, NT1 and NT2.

33. Record that the terminals follow the countdown and channel controller transition without a shift in FOW timing.

34. Log-out the ACC, NT1 and NT2. Stop the DMCU.

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D-11 SERVICE PREEMPTION

1. Place equipment in SF, SC configuration as depicted in Figure 1. Connect data terminal to Port 1 of NT1 and NT2.

NOTE: For half-duplex terminals, use zero delay at the satellite simulator.

2. Configure PCC and ACC using default values except:

(a) Set System Access Restriction = ROUTINE.

(b) Add subnet 20003 and 20005, including NT1 and NT2.

(c) Set all Terminal Access Restrictions to FLASH OVERRIDE.

(d) Set all terminal C/No equal to 48 dB-Hz.

3. Configure NT1 and NT2 using default values except add subnet 20003 and 20005 to Guard Lists.

4. Bring up PCC. Observe continuous FOW output.

5. Log in ACC, NT1 and NT2. Observe that terminals acquire and execute Log-in protocol.

6. Request an asynchronous data circuit service from NT1 to NT2 at 300 bps, immediate precedence. Observe service obtain assignment. Initiate data transmission from NT1 to NT2.

7. Initiate a subnet message service from ACC Port 1 to subnet 20003 at precedence ROUTINE, and send the message “msg150.txt”.

8. Initiate a subnet message service from PCC Port 1 to subnet 20005 at precedence ROUTINE, and send the message “msg100.txt”.

9. Wait until all three services are shown as active on PCC Service Request Queue. Record three simultaneous active services at NT1 and NT2. Record that the FIREBERD at NT2 does not lose sync.

10. Teardown the 300 bps circuit data service. Connect computers running communication software to the port of NT1 and NT2. Allow both message services to complete. Record if the entire “msg150.txt” message was received by the NT1 and NT2. Record if the entire “msg100.txt” message was received by NT1 and NT2.

11. Initiate point-to-point message service from NT2 to NT1 at precedence IMMEDIATE, and send the message “msgmax.txt”.

12. Initiate subnet message service from ACC Port 1 to subnet 20003 at precedence ROUTINE, and send the message “msg100.txt”.

13. Initiate subnet message service from PCC Port 1 to network 20005 at precedence ROUTINE, and send the message “msg150.txt”.

14. Wait until all three services are shown as active on PCC Service Request Queue. Record three simultaneous active services at NT1 and NT2.

15. Initiate circuit voice service at precedence FLASH from PCC Port 2 to NT2. Observe service obtain assignment. Record two simultaneous active services at NT2 (PCC to NT2 voice and ACC to subnet 20003 message). Verify and record NT2 status of the two other, preempted, services (PCC to subnet 20005 message and NT2 to NT1 message).

16. Teardown circuit voice service at precedence FLASH from PCC Port 2 to NT2. Record resumption of message services from NT2 to NT1 and PCC to subnet 20005. Record three simultaneous active services at NT1 and NT2.

17. Allow all three message services to complete. Record if the entire “MAXMSG” message was received by NT1. Record if the entire “msg100.txt” message was received by NT1 and NT2. Record if the entire “msg150.txt” message was received by NT1 and NT2.

18. Log out ACC, NT1 and NT2.

19. Take PCC down.

D-12 RETRANSMISSION FLAG

1. Place equipment in SF, SC configuration as depicted in Figure 1.

2. Configure PCC and ACC using default values.

3. Configure NT1 using default values.

4. Bring up PCC. Observe continuous FOW output.

5. Disconnect the PCC input and log in the ACC. After the ACC has transmitted its ROW:Channel Controller Login twice, reconnect the PCC input. Log in NT1. Observe that NT1 acquires and executes Log-in protocol.

6. Add NT1 to subnet 20001 (“Odds”) using PCC window. Observe Terminal Address Add protocol run to completion. Retransmission flag should be reset (0) because of successful use of contention slot for log-in. Record the retransmission flag value.

7. Disconnect PCC IF input.

8. Initiate a circuit data service request from NT1 to PCC using default parameters. Observe on ACC event log that initial attempt and retry both fail. Wait slightly more than four frames after retry transmission.

9. Reconnect PCC IF input.

10. Request a status report from NT1. Record that the retransmission flag is set (1).

11. Attempt the circuit data service request from NT1 to PCC again, using default parameters. Observe this circuit setup succeed.

12. Teardown circuit.

13. Request a status report from NT1. Record that the retransmission flag is reset (0) because of the response to the circuit request sent in a contention slot.

14. Disconnect PCC IF input.

15. Initiate the circuit data service request from NT1 to PCC again, using default parameters. Observe on ACC event log that initial attempt and retry both fail.

16. Reconnect PCC IF input.

17. Request a status report from NT1. Record that the retransmission flag is set to (1).

18. At PCC, change the ROW Backoff Number from 1 to 30. On the "USAF UHF 5 kHz/25 kHz Channel Controller" screen, click on "5 kHz Networking" then click on "Controlled DAMA/TDMA Channels". Highlight the channel and click on "Controls" and "ROW Backoff". Set the screen to "Fixed" and "30" and click OK. Observe change on PCC Event Log.

19. For MIL-STD-188-182A compliant terminals, attempt to transmit a contention ROW:Status Report. Record that the terminal does not transmit the ROW.

20. Request a status report from NT1. Record that the retransmission flag is reset (0) because of the Backoff Number change.

21. Disconnect PCC IF input.

22. Initiate the circuit data service request from NT1 to PCC once again, using default parameters. Observe on ACC event log that initial attempt and retry both fail.

23. Record the Time of Day from ACC event log for the frame in which the unsuccessful retry is seen.

24. Reconnect PCC IF input.

25. Request a status report from NT1. Record that the retransmission flag is set to (1).

26. At 29 minutes after the time recorded in step # 22, request a status report from NT1. Record that the retransmission flag is still set (1). Record Time of Day from ACC Event Log.

27. At 31 minutes after the time previously recorded in step #22, request a status report from NT1. Record that the retransmission flag is reset (0) because 30 minute timer has expired.

28. Initialize the modem at the ACC. Log out NT1. Take PCC down.

D-13 FUTURE FOW RECEPTION

1. Place equipment in SF, SC configuration as depicted in Figure 1. At the PCC, use DMCU in place of the NCS. Connect FIREBERDs to NT1 and NT2.

2. Configure ACC, NT1, and NT2 using default values, with the ports of NT1 and NT2 set for synchronous data.

3. Bring up DMCU running “prffw” script. Observe continuous FOW output. Script runs 20 frames (about 3 minutes) before Future FOW segment starts.

4. Log in ACC, NT1, and NT2 using remote option within 3 minutes of DMCU startup. Observe that terminals acquire.

5. Once Future FOW segment begins and preassigned circuit between NT1 and NT2 is set up, start NT2 FIREBERD. Record the NT1 FIREBERD achieves synchronization.

6. Let DMCU run for at least 40 more frames. Record that NT1 FIREBERD remains continuously synchronized.

7. Verify and record from the ACC event log that both terminals respond to the FOW:Report Status during the entire time.

8. Log out NT1 and NT2. Initialize the ACC modem.

9. Stop the DMCU.

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D-14 CONTENTION RANGING BACK-OFF ALGORITHM

1. Place equipment in SF, SC configuration as depicted in Figure 1 with 0 delay on the satellite simulator, and with unencrypted orderwires at the PCC.

2. Configure PCC using default values.

3. Configure NT1 using default values, except set NT1 for active ranging and unencrypted orderwires.

4. Bring up PCC. Observe continuous FOW output on Event Log.

5. Log in NT1. NT1 modem will acquire network and attempt initial ranging burst. When the ranging burst is observed on the PCC event log, record the actual frame number and building block offset from the event log. Continue to record the frame number each time the ranging burst is observed as the terminal proceeds through the ranging backoff algorithm. Immediately after the 8th ranging attempt, stop NT1 from attempting to log in. Determine whether the ranging bursts were transmitted in a random manner.

6. Take PCC down.

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D-15 DEDICATED CHANNELS

1. Configure the PCC, ACC, NT1, and NT2 into the single footprint, single channel configuration as depicted in Figure 1 except set the satellite simulator to the 25K filter. Set Channel to 150 (Uplink 302.615, Downlink 249.015). Connect FIREBERD to NT1 and NT2 as data source.

2. Configure the PCC and ACC using default values.

3. Configure NT1 and NT2 using default values. Verify NT1 indicates terminal is Automatic Frequency Change (AFC) capable. If the terminal can be set to non-AFC capable, verify NT2 indicates terminal is not AFC capable. If the terminal cannot be set for not AFC capable, log in Terminal 100 with the "Frequency Agile" block not checked.

4. Bring up the PCC. Observe FOW output.

5. Login the ACC, NT1 and NT2. Observe that terminals acquire and perform login protocol.

6. At the PCC and the ACC, enable Channel 149 5-kHz bandwidth DASA channel in the “Channels” database. On the “USAF UHF 5kHz Network Controller” screen, click on “Configuration” and “Channels”. When the “Channels” screen comes up, arrow down to the selected channel. Double-click on the channel line, and click on “DASA/Dedicated in the “Usage” box. Place a checkmark in the "In DASA Pool" box. Click “OK” and close the “Channels” screen. Observe the display of the channel in the PCC’s Controlled DASA Channels dialog window.

7. From NT1, request a dedicated circuit service (PRIORITY, 5-kHz, 2400 bps synchronous unencrypted data, unlimited duration, half-duplex) to NT2 (or to NT100 as required). Record the data from the ROW:Circuit Setup and observe the FOW:Circuit Setup Response. Record that the terminal informs the operator that the service is denied, due to a frequency switching incompatibility, and that the terminal does not change channels.

8. From NT2, if it can be set to not AFC capable, request a dedicated circuit service (FLASH, 5-kHz, 1200 bps synchronous unencrypted data, unlimited duration, half-duplex) to NT1. Observe that the terminal does not attempt to request the service, and record the operator notification indicating that the terminal is not AFC capable.

9. Log out NT2, change the terminal to AFC-capable, and log NT2 back in.

10. From NT1, request a dedicated circuit service (5-kHz, 2400 bps synchronous unencrypted data, 10 minute duration) to NT2. Observe the PCC’s FOW:Terminal Channel Assignment messages to NT1 and NT2. Record the ROW:Terminal Channel Assignment Response generated by NT1 and NT2 accepting

the assignment. Observe NT1 and NT2 move to the indicated channel. Initiate data from NT1 to NT2, then from NT2 to NT1 to verify communications on the correct frequency. Record connectivity established.

11. At the PCC, request a point-to-point, FLASH, DAMA data circuit from the PCC to NT2. Observe that the service is queued in the PCC's Service Request Queue.

12. From NT1 and NT2, teardown the DASA assignment. Observe NT1 and NT2 return to the home DAMA channel. Observe the reacquisition of the home DAMA channel, and record NT1 and NT2 output of the ROW:Terminal Channel Return.

13. Observe the activation of the PCC to NT2 circuit service. Record that NT2 shows this service active in its service queue. Transmit data from the PCC to NT2 and record that the FIREBERD obtains synchronization. Teardown the circuit service from the PCC.

14. Request a dedicated service from NT1 to NT2 with a five minute duration.

15. Allow the terminals to remain on the dedicated channel until the time has expired.

16. Verify that the terminals return to the DAMA channel, and record that the terminals do not transmit a ROW:Terminal Channel Return once they acquire the channel.

17. Configure the terminals for an encrypted voice service using ANDVT encryption. For terminals that embed COMSEC, load the key. For terminals that do not embed COMSEC, connect ANDVTs to the I/O ports.

18. From NT1, request a Dedicated voice circuit to NT2 with a 5 minute duration. Observe NT1 and NT2 move to the indicated channel. Initiate voice communications from NT1 to NT2, then from NT2 to NT1 and record communications on the correct frequency. Allow the terminals to return to the DAMA channel.

19. Log out the ACC, NT1 and NT2. Take down the PCC. Set the satellite simulator back to 5-kHz filter.

D-16 DECODER PERFORMANCE

1. Place equipment in SF, SC configuration, with the additional test equipment indicated in Figure 2. The noise generator will be used to inject noise to obtain a BER of $1X10^{-5}$ over a period of 5 minutes.

2. BER measurements will be made using 3000 and 2400 sps burst rates, both uncoded and coded.

3. Configure PCC and NT1. Use default configuration values.

4. Log-in PCC. Log-in NT1. Observe continuous FOW output.

5. Configure the data link. Set the Link Quality at both terminals to 50 to force the PCC to assign a data circuit service with a symbol rate of 3000 sps uncoded.

6. Using the NCS software, set up a preassigned data circuit service from the PCC to NT1 using a 1200 bps I/O data rate. When service is assigned, press the RTS button on the PCC FIREBERD to begin transmitting data. Wait for NT1 FIREBERD to achieve synchronization.

7. Reset FIREBERD 2 to begin BER measurement. Allow the test to run 5 minutes, and verify that the BER is $1 X 10^{-5}$. Record the attenuation levels required to obtain this BER from the front of the noise generator and the step attenuator.

8. Change the Link Quality to 48 to force the PCC to assign a data circuit with a 3000 sps burst rate coded.

9. Decrease the attenuation on the noise generator to obtain a BER of $1 X 10^{-5}$ and allow the test to run 5 minutes. Record the attenuation levels required. The difference in the two attenuation levels is the gain realized from using the coder.

10. Repeat steps 5 through 9 with the link quality set to establish the data circuit with a 1200 sps symbol rate. Set the terminal C/No to 49 to establish the uncoded circuit, then to 40 to establish the coded circuit.

11. Log-out PCC and NT1.

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D-17 FOW ACQUISITION

1. Place equipment in SF, SC configuration as depicted in Figure 2, with the noise source set to provide a receive link quality of 41.

2. Configure the PCC and NT1. Use default configuration values.

3. Bring up PCC. Observe continuous FOW output.

4. Log in NT1. Record that terminal acquires the downlink and executes Log-in protocol.

5. Establish a 2400 bps data circuit from NT1 to the PCC. Initiate data transmission from NT1. If NT1 misses a FOW, the terminal will not transmit in the next frame. Monitor NT1 for missed FOWs for the duration specified in Table D-6. Record the number of missed FOWs at the various test levels. If at any level the number of missed FOWs is ≤ Max. # Missed Acquisitions from the Table entry, the test has been successfully completed and should be terminated. If at any level the number missed is > Max. # Missed Acquisitions then advance to the next test level. If the number of missed acquisitions at level 5 still exceeds Max. # Missed Acquisitions then the test is a failure.

6. Log out NT1. Take PCC down.

Table D-6. FOW Acquisition Test Duration

Test Level	Test Time (Trials)	Test Time (minutes)	Max. # Missed Acquisitions
1	390	59	0
2	581	87	1
3	748	112	2
4	906	136	3
5	1200	180	5

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D-18 C/NO ESTIMATION

1. Place equipment in SF, SC configuration, with the noise source connected to inject noise into the input of NT1 as detailed in Figure 2. Configure the satellite simulator for 0 delay and No Filter.

2. Configure PCC and NT1 using default configuration values except set the controller for back-to-back, the pulling interval to 5 minutes, and configure NT1 for passive ranging and 0 delay.

3. Configure the noise source to provide a link quality of 33 at NT1 receive. Measure the signal level with the PCC transmitting CW. To cause the PCC to transmit CW, start log-in. After you click OK on the Start Frame screen, go to memory access and poke the value "BABE" in address B9E8. Measure the CW level with the noise generator turned off. The required noise level for a link quality of 33 is (Po + (-33)) where Po is the measured CW level.

4. Bring up PCC. Observe continuous FOW output.

5. Log in NT1. Observe that terminal acquires and executes Log-in protocol. Record the Link Quality estimate provided in the ROW:Log-in message on the PCC Event Log.

6. For MIL-STD-188-182 compliant terminals, wait three minutes and request a status report from NT1. Record the Link Quality estimate provided in the ROW:Status Report response in the PCC event log.

7. For MIL-STD-188-182A compliant terminals, wait five minutes and request a status report from NT1. Record the Link Quality estimate provided in the ROW:Status Report response.

8. For MIL-STD-188-182A compliant terminals, wait five more minutes, request another status report and record the Link Quality estimate.

9. Log-out NT1.

10. For MIL-STD-188-182 compliant terminals, repeat steps 3-9 two times, first setting the noise source to provide a link quality of 41 (Po + (-40.7)), and then with a link quality of 50 (Po + (-50)).

11. For MIL-STD-188-182A compliant terminals, repeat steps 3-9 four times, first setting the noise source to provide a link quality of 41, then a link quality of 49 (Po + (-49)), then with a link quality of 32 (Po + (-32)), then with a link quality of 50.

12. For MIL-STD-188-182A compliant terminals, without logging out NT1, adjust the noise to achieve a link quality of 49. From NT1, attempt to generate a contention ROW:Status Report. Record that the ROW is not transmitted.

13. For MIL-STD-188-182A compliant terminals, without logging out NT1, adjust the noise to achieve a link quality of 46. From NT1, attempt to generate a contention ROW:Status Report. Record that the ROW is transmitted.

14. Log out NT1. Take the PCC down.

D-19 UPLINK FREQUENCY ACCURACY

1. Configure the PCC, NT1 and NT2 as depicted in Figure 3 using default configuration values, except set the controller for back-to-back operation and set the terminals for passive ranging and “0” delay. Set the delay in the Satellite Simulator to 0 ms. Set the signal generator for 53.6 MHz and 0 dB output.

2. Log in the PCC. Observe FOW output.

3. Log in NT1 and NT2. Observe that both terminals acquire and perform log-in protocol.

4. Prepare for a data circuit service by setting the Link Quality Upper Limit and Lower Limit to 450 for both NT1 and NT2. This will cause the PCC to assign a 3000 sps coded modulation slot when the data circuit is requested.

5. Using the PCC NCS software, setup a preassigned circuit data service request at 2400 bps with NT1 as Source and NT2 as Destination service. Observe on PCC event log that the data service is assigned.

6. Initiate data I/O transmission on the FIREBERD connected to the NT1 modem by pressing RTS.

7. The maximum frequency shift for an airborne terminal, which includes uplink doppler, downlink doppler, terminal oscillator error and FOW error is 1200 Hz. The transmit terminal is required to shift its transmit to compensate for this. The receive signal of NT2 will be shifted 1200 hertz by changing the mixer signal output from the signal generator 100 hertz at a time up to +/-1200 Hz. Monitor the receive of NT2 and record the frequency shift if synchronization is lost.

8. Reset signal generator to the channel shift.

9. Initiate I/O transmission on the FIREBERD connected to NT2.

10. Using the signal generator, shift the receive frequency of NT2 1200 Hz above and below the assigned receive frequency. Monitor the receive of NT1 and record the frequency shift if synchronization is lost.

11. Log out NT1 and NT2. Take down the PCC.

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D-20 ADJACENT CHANNEL EMISSIONS

1. Place equipment in SF, SC configuration with the test equipment indicated in Figure 4. Connect a FIREBERD to both terminals.

2. Configure the PCC and NT1 using default configuration values.

3. Bring up PCC. Observe continuous FOW output on event log.

4. Ensure that NT1 is set to 18 dBw, or to full transmit power if the terminal does not transmit above 18 dBw. Log in NT1. Observe that terminal acquires FOWs and executes log-in protocol.

5. On the PCC NCS, prepare for a circuit service by setting the Link Quality Upper Limit and Lower Limit to 410 for both the PCC and NT1. This will cause the PCC to assign a 3000 sps coded modulation slot when the circuit is requested. Set both FIREBERDs for an externally supplied clock and a 2047 pattern.

6. Using the PCC NCS software, setup a preassigned circuit service request with NT1 as Source and the PCC as Destination service. Observe on PCC event log that the service is assigned.

7. Initiate I/O transmission on the FIREBERD connected to NT1 by pressing RTS. Verify that synchronization is achieved on the FIREBERD connected to the PCC modem. Disconnect the transmit of the terminal, but leave the receive connected. Using a power meter, measure and record the actual transmit power of NT1.

8. On the spectrum analyzer, set the channel bandwidth (CBW) to 5 kHz and initially set the channel spacing (CSP) to 5 kHz. When the terminal starts to transmit, initiate a single sweep, and record the power readings using averaging set to 10. The spectrum analyzer settings used for the measurements should be:

   Sweep Time: Auto
   Res and Video BW: Auto
   Span: (2*CSP + CBW)
   Center Freq.: Transmit Frequency
   VBW/RBW Ratio 10x
   Video Avg: On = 10

9. Repeat step 8 for f = ±10 kHz, ±15 kHz, ±20 kHz, ±25 kHz and ±30 kHz by changing the channel spacing to 10 kHz, 15 kHz, 20 kHz, 25 kHz and 30 kHz respectively. Change the span to match.

10. Insert a 0 dB signal from a signal generator at the cable connected to the output of the terminal and measure the attenuation in the test setup.

11. For terminals that transmit above 18 dBw, repeat steps 8 through 10 with the NT1 power set to the maximum output power.

12. Log out NT1. Take PCC down.

13. Use the JITC spreadsheet to determine actual ACE values for each test case.

D-21 MULTIPLE CHANNELS

1. Configure the equipment in the single footprint (SF), double channel (DC) configuration as depicted in Figure 5. Define modem 2 at the PCC with an address of 10 and with channel 153 selected as its home channel. Set the satellite simulator channel to channel 152 and select 25 kHz bandwidth.

2. Load crypto key number 1 into the PCC modem 1 and modem 2. At NT1 and NT2, load key 1 into position 1.

3. Log in the PCC on channel 151 and channel 153. After the PCC has logged in, log in NT1 on channel 151, and log in NT2 on channel 153. Log in terminal 100 as a dummy terminal on Channel 151.

4. At NT1, record the PCC address. At NT2, record the PCC address.

5. From NT1, request a data circuit service (IMMEDIATE, 5-kHz, 1200 bps synchronous unencrypted data, half-duplex, not global) to PCC. Observe that the service is activated.

6. From NT1, request a DAMA data circuit service (ROUTINE, 5-kHz, 2400 bps synchronous unencrypted data, half-duplex, not global) to PCC. Observe that the service is queued local.

7. Examine the NT1 Services and record the service status data.

8. From the PCC, select NT1 and use the Controls menu item to modify the home channel for NT1. Select channel 153. Observe that the PCC outputs a FOW:Terminal Channel Assignment message to NT1 on channel 151. Record the ROW:Terminal Channel Assignment Response generated by NT1 accepting the assignment.

9. Record NT1 shows a channel status of channel 153, and acquires the channel.

10. Record that no ROW:Login is generated by NT1. As soon as NT1 acquires on channel 153, examine the NT1 services and verify the services that are shown. Wait unitl NT1 is “Logged-in”, and services are deleted from the service request queue.

11. From NT1, request a DAMA data circuit service (IMMEDIATE, 5-kHz, 2400 bps synchronous, unencrypted data, half-duplex, not global) to NT2. Observe the ROW:Circuit Setup and the PCC response. Observe that the service is activated by the PCC as seen in the Service Request Queue.

12. From NT1, request a DAMA unencrypted data if single port radio circuit service (ROUTINE, 5-kHz, 2400 bps synchronous, unencrypted data, half-duplex, not global) to PCC. Observe that the service is queued local.

13. Examine NT1 and record the service status data.

14. From the PCC Terminals screen, select NT1 and use the Controls menu item to modify the home channel for NT1 to channel 152. Observe that the PCC outputs a FOW:Terminal Channel Assignment message to NT1. Record the ROW:Terminal Channel Assignment Response generated by NT1 accepting the assignment.

15. Record NT1's status reflecting a move to the selected channel, its attempt to acquire for 90 seconds and its return to channel 153. Observe the preemption of the circuit service between NT1 and NT2 at the PCC Service Request Queue.

16. Record NT1's ROW:Terminal Channel Return indicating failure to acquire on channel 152. Observe the PCC's answering FOW:Contention Response.

17. Observe the reactivation of the circuit service between NT1 and NT2 after NT1 returns to its home channel. Note that the terminal is not required to retain knowledge of active services through a channel reassignment, so a terminal teardown is possible upon reactivation. If the service remains active, teardown the circuit service at the PCC.

18. From the PCC Terminals screen, select NT1 and use the Controls menu item to modify the home channel for NT1 to channel 16. Observe that the PCC outputs a FOW:Terminal Channel Assignment message to NT1. Observe the ROW:Terminal Channel Assignment Response generated by NT1 accepting the assignment.

19. Record NT1's status reflecting a move to the selected channel, its attempt to acquire for 90 seconds and its return to channel 153.

20. Record NT1's ROW:Terminal Channel Return indicating failure to acquire on channel 16. Observe the PCC's answering FOW:Contention Response.

21. Coordinate with the 25-kHz testbed to perform the next steps.

22. From the PCC Terminals screen, select NT1 and use the Controls menu item to modify the home channel for NT1 to the channel on which the 25-kHz controller is operating. Observe that the PCC outputs a FOW:Terminal Channel Assignment message to NT1. Record the ROW:Terminal Channel Assignment Response generated by NT1 accepting the assignment. Connect the transmit and receive cables to the 25-kHz testbed so that the terminal will see the Channel Control Orderwire (CCOW). Record that the terminal acquires the 25-kHz network and is active on the network.

23. Request that the 25-kHz controller assign NT1 to channel 151. Observe that the terminal acquires channel 151 and that no ROW:Login is transmitted when the terminal acquires the channel. Request a status report from NT1 to verify that the terminal is active on the channel. Record receipt of the status report from the terminal.

24. Initiate a 1200 bps circuit service from NT1 to the PCC and another from NT2 to the PCC. Observe that both circuits are established.

25. From the PCC operator position, order the dedicated channel mode transition for Channel 153. Log out modem 10, and check the "Transition Modem to Reserve/Unavailable" option on the log-out screen.

26. View the FOW log entries on the PCC to verify it matches the expected values (12, 11, 10, 9) for the FOW:Dedicated Channel Mode Countdown. Record that NT2 notifies the operator of the countdown, and that the terminal ceases operation on Channel 153 in the frame following the frame with the value of 9.

27. Record continued DAMA service on Channel 151.

28. Open the channels screen on the PCC and modify channel 153 to DAMA operation.

29. Log out NT2. Take down the PCC.

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D-22 RANGING

1. Place equipment in SF, SC configuration as depicted in Figure 1. Set the satellite simulator for 250 ms delay. Place a signal sampler at the output of the PCC, NT1 and NT2.

2. Connect the PCC uplink to channel 1 of the oscilloscope; connect the output of NT1 to channel 2 of the oscilloscope.

3. Configure PCC using default values. Set the PCC for encrypted orderwire.

4. Configure NT1 using default values. Set the terminal for encrypted orderwire.

5. Roll the display on the oscilloscope.

6. Bring up PCC. Observe continuous FOW output.

7. Log in NT1. Determine that terminal acquires, ranges, and executes Log-in protocol.

8. Stop the oscilloscope display when the terminal transmits its initial contention ranging burst. Measure and record the time from the start of the FOW to the start of the ranging burst. At the PCC, record the Frame Offset (in building blocks) for the ranging burst. Also record the PCC event log time for the ranging burst. Record the range delay as reported at the terminal.

9. Roll the display on the oscilloscope.

10. At the PCC, request a status report from NT1. Observe ROW:Status Report receipt on PCC event log.

11. Stop the oscilloscope display when the terminal transmits its ROW. Measure and record the time from the start of the FOW to the start of the ROW. At the PCC, record the Frame Offset for the ROW.

12. Roll the display on the oscilloscope attached to NT1.

13. Initiate a 2400 bps unencrypted synchronous circuit data service from NT1 to the PCC.

14. Stop the oscilloscope display when the terminal transmits its ROW. Measure and record the time from the start of the FOW to the start of the ROW. At the PCC, record the Frame Offset for the ROW.

15. Roll the display on the oscilloscope.

16. Start NT1 FIREBERD. Verify that the PCC FIREBERD synchronizes.

17. Stop the oscilloscope display when the terminal transmits its first COM burst. Measure and record the time from the start of the FOW to the start of the COM burst. At the PCC, record the Frame Offset for the COM burst. Teardown the circuit at the PCC.

18. Move the scope probe from the output of NT1 to the output of NT2. (The probe will be moved each time the measurements change, but will not be called out in the procedure.)

19. Configure NT2 using default values. Configure the terminal for encrypted orderwire.

20. Repeat steps 7 and 8 for NT2. If 20 minutes have not elapsed since NT1 logged in, wait until 20 minutes have passed to log in NT2.

21. At 2.25 hours (900 frames) after step 8, request a status report from NT1. Measure and record the time from the FOW to the ROW:Status Report on the oscilloscope, and record the offset in building blocks from the PCC event log.

22. At 2.25 hours (900 frames) after step the time recorded in step 20, request a status report from NT2. Measure and record the time from the FOW to the ROW:Status Report on the oscilloscope, and record the offset in building blocks from the PCC event log.

23. At 4 hours (1600 frames) after step 8, request a status report from NT1. Measure and record the time from the FOW to the ROW:Status Report on the oscilloscope, and record the offset in building blocks from the PCC event log. Disconnect NT1 output to the antenna (but not to the logic analyzer) and connect to a 30 dB attenuator and termination. Roll the display on the oscilloscope. On the PCC event log, observe subsequent ranging slot assignment to NT1 (at 255 minutes after the time recorded in step 8). The NT1 ranging burst should appear on the oscilloscope.

24. Reconnect NT1 output to the antenna. Observe the log at the PCC; NT1 will request a ranging assignment from the controller. Record the data for the ROW:Assign ranging, and record the time from the FOW to the ROW ranging burst. Record the ranging burst offset in building blocks from the PCC log.

25. At 4 hours (1600 frames) after the time recorded in step 20, request a status report from NT2. Measure and record the time from the FOW to the ROW:Status Report on the oscilloscope, and record the offset in building blocks from the PCC event log. At 4 hours and 10 minutes after the recorded time, disconnect the receive of NT2. On the PCC event log, observe subsequent ranging slot assignment to NT2 (at 255

minutes after the time recorded in step 20). After the FOW is transmitted, reconnect the receive on NT2.

26. Observe the log at the PCC; NT2 will request a ranging assignment from the controller. Record the time from the FOW to the ROW ranging burst. Record the ranging burst offset in building blocks from the PCC log.

27. Log out NT1 and NT2 and take the PCC down.

28. For terminals that implement passive ranging, the test will need to be performed again. This portion of the test can be performed in conjunction with other tests.

NOTE: Some termianls may reuire Ephemeris Data to acquire the network. In tis case, test Ephemeris Data should be supplied by the Customer. Other terinals may require that the range delay be set prior to Log-on. In this case, use the delay setting of the SATSIM.

29. Configure the PCC with default settings, but configure NT1 as passive ranging.

30. Roll the oscilloscope. Log in NT1. Observe that no ranging burst is transmitted. Record the log-in time from the PCC. Complete ROW Log-in Sheet.

31. Stop the oscilloscope display when the terminal transmits its ROW. Measure and record the time from the start of the FOW to the start of the ROW. At the PCC, record the Frame Offset for the ROW.

32. Roll the display on the oscilloscope attached to NT1.

33. At the PCC, request a status report from NT1. Observe ROW:Status Report receipt on PCC event log.

34. Stop the oscilloscope display when the terminal transmits its ROW. Measure and record the time from the start of the FOW to the start of the ROW. At the PCC, record the Frame Offset for the ROW.

35. Roll the display on the oscilloscope attached to NT1.

36. At 2.25 hours (900 frames) after step the time recorded in step 30, request a status report from NT1. Measure and record the time from the FOW to the ROW:Status Report on the oscilloscope, and record the offset in building blocks from the PCC event log.

37. At 4 hours (1600 frames) after step 30, request a status report from NT1. Measure and record the time from the FOW to the ROW:Status Report on the oscilloscope, and record the offset in building blocks from the PCC event log.

38. At 4.5 hours after step 30, request a status report from NT1. Measure and record the time from the FOW to the ROW:Status Report on the oscilloscope, and record the offset in building blocks from the PCC event log.

39. Log out NT1.

D-23 OVER-THE-AIR COMMUNICATIONS

1. Place equipment in SF, SC configuration, interconnected over-the-air as depicted in Figure 6. Connect a KG-84A and FIREBERD to Port 1 of the PCC and to NT1 (if COMSEC is not embedded). Connect an ANDVT to port 2 of the PCC and to NT2 (if COMSEC is not embedded).

2. Log-in the PCC, NT1 and NT2. Observe that the terminals are logged in on the Terminals screen at the PCC.

3. Request a data circuit from NT1 to the PCC at 2400 bps, encrypted data. Once the circuit is established, assert RTS at the FIREBERD connected to NT1. Verify and record that the FIREBERD at the PCC obtains synchronization. Deassert RTS after four frames.

4. Assert RTS at the FIREBERD connected to the PCC. Verify and record that the FIREBERD at the NT1 obtains synchronization. Deassert RTS after four frames.

5. Request a voice circuit from NT2 to the PCC. Once the circuit is established, verify and record voice connectivity from NT2 to the PCC and from the PCC to NT2.

6. Connect the ADC and KG-84A to port 1 of the PCC, and to NT1. Request a message service from NT1 to the PCC and transmit MSG100.txt. Verify and record correct reception of the message at the PCC.

7. Request a message service from the PCC to NT1 and transmit MSG100.txt. Verify and record correct reception of the message at NT1.

8. Log out NT1, NT2 and the PCC.

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APPENDIX E

DATA COLLECTION SHEETS

The following pages contain the data collection sheets which will be used for testing.

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E-1 LOGIN, REPORT STATUS, AND LOGOUT

The following checklist will be completed as the actions in the Test Step are performed. The actions requiring the completion of additional data sheets are annotated in the Notes column.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
14	NT1 log-in		Complete ROW:Login data sheet
14	NT2 log-in		Complete ROW:Login data sheet
15	NT1 status report		Complete ROW:Status Report data sheet
15	NT2 status report		Complete ROW:Status Report data sheet
16	I/O Sync NT1 and NT2		
18	NT1 I/O sync loss		
18	NT1 operator notification		
18	NT2 sync		
20	NT2 ROW:Logout		Complete ROW:Logout data sheet
21	NT2 operator notification		
23	NT2 Login		Complete ROW:Login data sheet
25	NT1 notification not logged in or continued attempts		
25	NT1 rejection of service		
25	NT1 notification of rejection		
28	Local NT1 rejection		
28	NT1 notification to operator		
29	NT1 rejection (address 0)		
30	NT1 rejection (Guard List 0)		
32	NT1 Notification		
32	NT2 does not log out		
33	No login by NT1		

ROW:LOGIN (NT1)

FIELD	EXPECTED VALUE	RECEIVED	NOTES
Message Type	6		
I/O Data Rate	001f		801f for -182A Terminals
Link Quality	50		
Guard List Size	1		
Guard List CRC	85b2		
Terminal Type	0		
Silent Terminal Indicator	0		
Terminal Standard Version	0		Expect value 1 for -182A terminal
Automatic Frequency Change Capability	1		
Ranging Flag	0		
Retry Flag	0		
Reserved Bits	0		

ROW:LOGIN (NT2)

FIELD	EXPECTED VALUE	RECEIVED	NOTES
Message Type	6		
I/O Data Rate	001f		801f for -182A terminals
Link Quality	50		
Guard List Size	1		
Guard List CRC	07e8		
Terminal Type	0		
Silent Terminal Indicator	0		
Terminal Standard Version	0		Expect value 1 for -182A terminal
Automatic Frequency Change Capability	1		
Ranging Flag	0		
Retry Flag	0		
Reserved Bits	0		

ROW:LOGIN (NT2)
(Second Login)

FIELD	EXPECTED VALUE	RECEIVED (Text)	NOTES
Message Type	6		
I/O Data Rate	001f		801f for -182A terminals
Link Quality	50		
Guard List Size	1		
Guard List CRC	2656		
Terminal Type	0		
Silent Terminal Indicator	1		
Terminal Standard Version	0		Expect value 1 for -182A terminal
Automatic Frequency Change Capability	1		
Ranging Flag	0		
Retry Flag	0		
Reserved Bits	0		

ROW:STATUS REPORT (NT1)

FIELD	EXPECTED VALUE	RECEIVED (Text)	NOTES
Message Type	24		
I/O Data Rate	0001f		801f for -182A terminals
Link Quality	50		
Guard List Size	1		
Guard List CRC	85b2		
Terminal Type	0		
Silent Terminal Indicator	0		
Terminal Standard Version	0		Expect value 1 for -182A terminal
AFC Capability	1		
Ranging Type	0		
Retransmission Field	0		
Reserved Bits	0		

ROW:STATUS REPORT (NT2)

FIELD	EXPECTED VALUE	RECEIVED (Text)	NOTES
Message Type	24		
I/O Data Rate	0001f		801f for -182A terminals
Link Quality	50		
Guard List Size	1		
Guard List CRC	07e8		
Terminal Type	0		
Silent Terminal Indicator	0		
Terminal Standard Version	0		Expect value 1 for -182A terminal
AFC Capability	1		
Ranging Type	0		
Retransmission Field	0		
Reserved Bits	0		

ROW:LOGOUT

FIELD	EXPECTED VALUE	RECEIVED (Text)	NOTES
Message Type	7		
Retry Flag	0		
Reserved Bits	0		

E-2 ADDRESS MANAGEMENT CHECKLIST

The following checklist will be completed as the actions in the Test Step are performed. The actions requiring the completion of additional data sheets are annotated in the Notes column.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
6	Terminal address seen on range burst		
7	NT1 transmits ROW:Terminal Address Report		Complete ROW Data Sheet
7	NT1 responds to all FOW:Terminal Address Add or Delete		
7	No FOW:Report Terminal Address to NT2		
8	NT1 transmits ROW:Terminal Address Add or Delete Response (0)		Complete ROW Data Sheet
8	NT1 transmits ROW:Terminal Address Add or Delete Response (1)		Complete ROW Data Sheet
10	PCC & NT2 Guard Lists match		
10	Guard List CRC (NT2)		
11	I/O Connectivity Established		
15	NT2 loss of FIREBERD sync		
15	NT1 connectivity remains		
17	32000 no longer on NT2 Guard List		
18	Guard List CRC		
21	NT2 transmits ROW:Terminal Address Add or Delete Response		
22	32000 on NT2 Guard List		
24	NT2 logged out and operator notified		
28	ACC event log verifies actions in Table.		
29	NT2 Guard List empty. Address 200 not on NT1 Guard List.		

ROW:TERMINAL ADDRESS REPORT

FIELD	EXPECTED VALUE	RECEIVED (Text)	NOTES
Message Type	26		
Guard List Index	0		
Address 0	100		
Address 1	200		
Address 2	300		
Retransmission Flag	0		
Reserved Bits	0		

ROW:TERMINAL ADDRESS ADD OR DELETE RESPONSE

FIELD	EXPECTED VALUE	RECEIVED (Text)	NOTES
Message Type	25		
Request Status	1		
Address	100		
Retransmission Flag	0		
Reserved Bits	0		

ROW:TERMINAL ADDRESS ADD OR DELETE RESPONSE

FIELD	EXPECTED VALUE	RECEIVED (Text)	NOTES
Message Type	25		
Request Status	0		
Address	102		
Retransmission Flag	0		
Reserved Bits	0		

E-3 MESSAGE SERVICE OPTIONS

The following checklist will be completed as the actions in the Test Step are performed. The actions requiring the completion of additional data sheets are annotated in the Notes column.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
6	ROW:Message Setup		Complete ROW data sheet
7	Message delivery complete		
9	ROW:Block Acknowledgment		Complete ROW data sheet
9	ROW:Message Acknowledgment		Complete ROW data sheet
10	NT1 and NT2 receive subnet message		
10	Messages complete at all modulation rates and coded conditions		
13	Virtual Port ids 0-4 used on NT1		
13	Five queued services at NT1		
15	Virtual Port ids 0-4 used on NT2		
15	Five queued services at NT2		
17	Local setup rejection		
19	NT1 notification of teardown		
19	Message setup failure		
20	Message setup complete with retry flag set (1)		
21	ROW:Message Teardown		Complete ROW data sheet
23	Message complete		
24	Message complete		
25	Message complete		
26	Message complete		
29	Trial 1: COM Burst 2		
29	Trial 2: ROW:Message Teardown		
29	Trial 3: COM Burst 2		
29	Trial 4: No Teardown		
30	Message complete		
31	Message rejected		
31	Partial message transmitted		
35	Message received at PCC		
36	Message received at NT1		
41	Teardown results match Table F-6		

MESSAGE-SERVICE COMMUNICATIONS OPTIONS

√	C/N_o (dB-Hz)	Modulation Rate (sps)	Coded
	48	3000	1
	45	2400	1
	44 *	3000	7/8
	43 *	3000	3/4
	42 *	2400	3/4
	41	3000	1/2
	39	2400	1/2
	37	1200	1/2
	35	600	1/2
	33	600	1/2
	32	600	1/2

ROW:MESSAGE SETUP

FIELD	EXPECTED VALUE	RECEIVED	NOTES
Message Type	9		
Destination Address	10		
Virtual Port	0-4		
Precedence	5		
Message Length in Data Blocks	147		
Encrypted Data	1		
Retry Flag	0		
Global Search	1		
Reserved Bits	0		

ROW:BLOCKS ACKNOWLEDGMENT

FIELD	EXPECTED VALUE	RECEIVED	NOTES
Message Type	18		
Service Source Address	10		
Virtual Port	0-4		
Block Number	10		
All Blocks Received	0		
Retransmission Flag	0		
Reserved Bits	0		

ROW:MESSAGE ACKNOWLEDGMENT

FIELD	EXPECTED VALUE	RECEIVED (Text)	NOTES
Message Type	8		
Source Address	10		
Destination Address	1		
Virtual Port	0-4		
Retransmission Flag	0		
Reserved Bits	0		

ROW:MESSAGE TEARDOWN

FIELD	EXPECTED VALUE	RECEIVED	NOTES
Message Type	10		
Source Address	1		
Destination Address	2001		
Virtual Port	0-4		
Reason	0		
Retry Flag	0		
Reserved Bits	0		

E-4 CIRCUIT SERVICE OPTIONS

The following checklist will be completed as the actions in the Test Step are performed. The actions requiring the completion of additional data sheets are annotated in the Notes column.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date**	
9	All rates supported		
9	Synchronous data supported		
9	Asynchronous data supported		
11	Voice rates supported		
13	-182 voice rates supported		
15	ANDVT at controller receives voice communication		
16	ANDVT at controller receives voice communication		
17	ROW:Circuit Setup		Complete ROW data sheet
18	Circuit teardown using COM Burst Type 2		
19	Circuit teardown using COM Burst Type 2 (MIL-STD-188-182)		
19	Circuit Teardown with ROW (MIL-STD-188-182A)		
21	Circuit teardown using ROW after 4 frames of COM Burst Type 3 (MIL-STD-188-182)		
22	Circuit teardown using ROW after 4 frames of COM Burst Type 3 (MIL-STD-188-182A)		
24	Circuit not torn down; COM Burst Type 0		
25	Circuit teardown using COM Burst Type 2		
26	Circuit not torn down; COM Burst Type 0		
28	Circuit teardown using ROW		Complete ROW data sheet
30	Circuit not torn down; COM Burst Type 0		
31	Circuit not torn down; COM Burst Type 0		
25	NT1 and NT2 operator notification		
41	Circuit torn down with ROW:Circuit Teardown		
43	Circuit torn down with ROW:Circuit Teardown		
45	Circuit torn down with ROW:Circuit Teardown		
50	Terminal does not teardown service		
51	Operator notified of teardown		
52	Terminal does not teardown service		
53	Operator notified of teardown		

DATA CIRCUIT-SERVICE COMMUNICATIONS OPTIONS

√	C/N_o (dB-Hz)	I/O Data Rate (bps)	Full or Half Duplex	Modulation Rate (sps)	Coded
	50	2400	Either	3000	1
	49	2400	Half	2400	1
	46 *	2400	Half	3000	7/8
	44 *	2400	Half	3000	¾
	43 *	2400	Half	2400	¾
	41	2400	Half	3000	½
	50	1200	Either	3000	1
	49	1200	Either	2400	1
	46 *	1200	Either	3000	7/8
	44 *	1200	Either	3000	¾
	43 *	1200	Either	2400	¾
	41	1200	Either	3000	½
	40	1200	Half	2400	½
	50	600	Either	3000	1
	49	600	Either	2400	1
	46 *	600	Either	3000	7/8
	44 *	600	Either	3000	¾
	43 *	600	Either	2400	¾
	41	600	Either	3000	½
	40	600	Either	2400	½
	38	600	Half	1200	½
	50	300	Either	3000	1
	48	300	Either	2400	1
	46 *	300	Either	3000	7/8
	44 *	300	Either	3000	¾
	43 *	300	Either	2400	¾
	42	300	Either	3000	½
	40	300	Either	2400	½
	38	300	Either	1200	½
	36	300	Half	600	½
	50	75	Either	3000	1
	48	75	Either	2400	1
	46 *	75	Either	3000	7/8
	44 *	75	Either	3000	¾
	43 *	75	Either	2400	¾
	42	75	Either	3000	½
	40	75	Either	2400	½
	38	75	Either	1200	½
	36	75	Either	600	½

Note: The "*" denotes rates that are only applicable to MIL-STD-188-182A.

VOICE CIRCUIT-SERVICE COMMUNICATIONS -182A OPTIONS

√	C/N_o (dB-Hz)	I/O Data Rate (bps)	Full or Half Duplex	Modulation Rate (sps	Coded	Data or Voice
	48	2400	Either	3000	1	Voice
	47	2400	Half	2400	1	Voice
	46 *	2400	Half	3000	7/8	Voice
	44 *	2400	Half	3000	¾	Voice
	43 *	2400	Half	2400	¾	Voice
	42	2400	Half	3000	½	Voice

Note: The "*" denotes rates that are only applicable to MIL-STD-188-182A.

VOICE CIRCUIT-SERVICE COMMUNICATIONS -182 OPTIONS

√	C/N_o (dB-Hz)	I/O Data Rate (bps)	Full or Half Duplex	Modulation Rate (sps	Coded	Data or Voice
	48	2400	Either	3000	1	Voice
	47	2400	Half	2400	1	Voice
	42	2400	Half	3000	½	Voice

ROW:CIRCUIT SETUP

FIELD	EXPECTED VALUE	RECEIVED (Text)	NOTES
Message Type	4		
Destination Address	2		
Virtual Port	0-4		
Circuit Type	0		
Asynchronous Service Indicator	0		
Precedence	5		
Duplex	0		
I/O Data Rate	4		
Encrypted Data	1		
Retry Flag	0		
Global Search	1		
Channel Type	0		
Dedicated Channel Indicator	0		
Configuration Code	0		
Channel Duration	0		
Reserved Bits	0		

ROW:CIRCUIT TEARDOWN

FIELD	EXPECTED VALUE	RECEIVED (Text)	NOTES
Message Type	5		
Source Address	1		
Destination Address	2		
Virtual Port	0-4		
Reason	0		
Retry Flag	0		
Reserved Bits	0		

E-5 BURST TYPE DETERMINATION

The following checklist will be completed as the actions in the Test Step are performed.

TEST CASE	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
1	FOW		
2	FOW		
3	FOW		
4	Missed FOW		
5	Missed FOW		
6	Missed FOW		
7	Missed FOW		
8	Missed FOW		

E-6 FOW DROPOUT

The following checklist will be completed as the actions in the Test Step are performed.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
8	Terminal logged in		
9	Terminal logged out		

E-7 CONTENTION ROW MESSAGE

The following checklist will be completed as the actions in the Test Step are performed.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
8	Four ROW:Logins		
8	Notification to operator after two login attempts		
10	Successful login		
12	Request failure, retry, NT1 notification		
15	Contention ROWs sent in random slots		

E-8 NETWORK ENTRY AND ROLLOVER

The following checklist will be completed as the actions in the Test Step are performed.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
10	Successful login of NT2		
13	Status Report from NT1 and NT2		
16	Status Report from NT1 and NT2		
17	Login unsuccessful		
17	Invalid key notification		
24	Status Report from NT1 and NT2		
25	NT2 zeroizes keys		
26	Keys 2, 3 and 6 in NT1 or NT1 stops receiving FOWs		
28	Terminal does not zeroize and continues operation		

E-9 TERMINAL/SYSTEM RESTRICTIONS

The following checklist will be completed as the actions in the Test Step are performed.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
6	TAR at NT1		
6	TAR at NT2		
7	Rejection, Terminal Access Restriction violation		
8	Circuit activated		
10	Circuit activated		
13	Terminal rejects circuit and notifies operator		
15	Terminal rejects circuit and notifies operator		

E-10 TERMINAL NETWORK TRANSITION PROTOCOL

The following checklist will be completed as the actions in the Test Step are performed.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
10	Channel control change notification to operator		
11	Service count correct		
12	NT1 and NT2 services correct		
19	Channel control change notification to operator		
20	NT1 service count incorrect		
20	Notification of incorrect services to operator		
21	NT1 resubmits services		
24	NT2 logged out with operator notification or automatic login		
28	NT1 receives FOW:Participant Status Database		
29	NT2 logged out with operator notification or automatic login		
33	Terminals follow controller transition		

E-11 SERVICE PREEMPTION

The following checklist will be completed as the actions in the Test Step are performed.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
9	Three services at NT1 and NT2		
9	No interruption to 300 bps service		
10	Both messages received at NT1 and NT2		
14	Three services at NT1 and NT2		
15	Two services at NT2		
15	NT2 Operator notification of preemption		
16	Resumption of message services		
16	Three services at NT1 and NT2		
17	Messages received at destinations		

E-12 RETRANSMISSION FLAG

The following checklist will be completed as the actions in the Test Step are performed.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
6	Retransmission flag=0		
10	Retransmission flag=1		
13	Retransmission flag=0		
17	Retransmission flag=1		
19	No contention ROW transmitted		
20	Retransmission flag=0		
23	TOD from ACC log		
25	Retransmission flag=1		
26	Retransmission flag=1		
26	TOD from ACC log		
27	Retransmission flag=0		

E-13 FUTURE FOW RECEPTION

The following checklist will be completed as the actions in the Test Step are performed.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
5	FIREBERD synchronized		
6	Continuous synchronization of FIREBERD		
7	Terminals respond to FOW:Report Status		

E-14 CONTENTION RANGING BACK-OFF ALGORITHM

The following checklist will be completed as the actions in the Test Step are performed.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
5	NT1 ranging frame number/Offset		
5	2nd ranging frame/Offset		
5	3rd ranging frame/Offset		
5	4th ranging frame/Offset		
5	5th ranging frame/Offset		
5	6th ranging frame/Offset		
5	7th ranging frame/Offset		
5	8th ranging frame/Offset		

E-15 DEDICATED CHANNELS

The following checklist will be completed as the actions in the Test Step are performed. The actions requiring the completion of additional data sheets are annotated in the Notes column.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
7	Service requested		Complete ROW data sheet
7	Service denied		
7	Terminal does not switch channels		
8	Local reject and operator notification		
10	NT1 and NT2 accept assignment		Complete ROW data sheet
10	Synchronization in both directions		
12	ROW:Terminal Channel Return		Complete ROW data sheet
13	Circuit active at NT2		
16	No ROW:Terminal Channel Return		
18	Communications established in both directions		

ROW:CIRCUIT SETUP

FIELD	EXPECTED VALUE	RECEIVED (Text)	NOTES
Message Type	4		
Destination Address	2		
Virtual Port	0-4		
Circuit Type	0		
Asynchronous Service Indicator	0		
Precedence	4		
Duplex	0		
I/O Data Rate	4		
Encrypted Data	1		
Retry Flag	0		
Global Search	0		
Channel Type	0		
Dedicated Channel Indicator	1		
Configuration Code	0		
Channel Duration	2		
Reserved Bits	0		

ROW:TERMINAL CHANNEL ASSIGNMENT RESPONSE

FIELD	EXPECTED VALUE	RECEIVED	NOTES
Message Type	27		
Change Response	1		
Retransmission Flag	0		
Reserved Bits	0		

ROW:TERMINAL CHANNEL RETURN

FIELD	EXPECTED VALUE	RECEIVED (Text)	NOTES
Message Type	28		
Retry Flag	0		
Reserved Bits	0		

E-16 DECODER PERFORMANCE

The following checklist will be completed as the actions in the Test Step are performed.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
7	Attenuation levels from Noise Source and variable attenuator		
9	Attenuation levels from Noise Source and variable attenuator		
9	Difference in levels		
10	Attenuation levels from Noise Source and variable attenuator		
10	Attenuation levels from Noise Source and variable attenuator		
10	Difference in levels		

E-17 FOW ACQUISITION

The following checklist will be completed as the actions in the Test Step are performed.

Test Level	Missed Acquisitions
Unit Under Test:	**Date:**
1	
2	
3	
4	
5	

E-18 C/NO ESTIMATION

The following checklist will be completed as the actions in the Test Step are performed.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
5	33		
5	41		
5	50		
5	32		
5	49		
6	33		
6	41		
6	50		
7	33		
7	41		
7	50		
11	33		
11	41		
11	50		
11	32		
11	49		
11	33		
11	41		
11	50		
11	41		
11	50		
12	ROW not transmitted		
13	ROW transmitted		

E-19 UPLINK FREQUENCY ACCURACY

The following checklist will be completed as the actions in the Test Step are performed.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
7	Terminal corrects and transmits in correct time slot		
10	Terminal receives FOWs and data with frequency shifted		

E-20 ADJACENT CHANNEL EMISSIONS

The following checklist will be completed as the actions in the Test Step are performed.

Low Power and High Power ACE

Date_____

Offset Channel (kHz)	3000 sps Coded SOQPSK Low			3000 sps Coded SOQPSK High		
	Po	Offset Channel		Po	Offset Channel	
	dBm	Lower Sideband	Upper Sideband	dBm	Lower Sideband	Upper Sideband
±5						
±10						
±15						
±20						
±25						
±30						

Supplemental Data

3000 sps Coded SOQPSK Low		3000 sps Coded SOQPSK High	
UUT Power		UUT Power	
Cable Loss		Cable Loss	
Total Power		Total Power	
EIRP		EIRP	

E-21 MULTIPLE CHANNELS

The following checklist will be completed as the actions in the Test Step are performed. The actions requiring the completion of additional data sheets are annotated in the Notes column.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
4	NT1 PCC address		
4	NT2 PCC address		
7	NT1 service status		
8	ROW:Terminal Channel Assignment Response		Complete ROW data sheet
9	NT1 acquires channel B		
10	No ROW:Login		
10	NT1 service status		
13	NT1 service status		
14	ROW:Terminal Channel Assignment Response		
15	NT1 attempts to acquire channel		
16	ROW:Terminal Channel Return		Complete ROW data sheet
19	NT1 attempts to acquire channel		
20	ROW:Terminal Channel Return		
22	ROW:Terminal Channel Assignment Response		
22	Terminal Acquires 25-kHz channel		
23	Terminal Acquires channel 151		
23	No ROW:Login		
23	ROW:Status Report		
26	NT1 operator notification		
26	NT1 ceases operation		
27	NT2 continues operation		

ROW:TERMINAL CHANNEL ASSIGNMENT RESPONSE

FIELD	EXPECTED VALUE	RECEIVED	NOTES
Message Type	27		
Change Response	1		
Retransmission Flag	0		
Reserved Bits	0		

ROW:TERMINAL CHANNEL RETURN

FIELD	EXPECTED VALUE	RECEIVED	NOTES
Message Type	28		
Retry Flag	0		
Reserved Bits	0		

E-22 RANGING

The following checklist will be completed as the actions in the Test Step are performed. The actions requiring the completion of additional data sheets are annotated in the Notes column.

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
Unit Under Test:		**Date:**	
8	Time from FOW to Range burst (NT1)		
8	PCC Frame Offset		
8	TOD from PCC Log		
8	Range delay (NT1)		
11	Time from FOW to ROW (NT1)		
11	PCC Frame Offset		
14	Time from FOW to ROW (NT1)		
14	PCC Frame Offset		
17	Time from FOW to COM burst (NT1)		
17	PCC Frame Offset		
20(8)	Time from FOW to Range Burst (NT2)		
20(8)	PCC Frame Offset		
20(8)	TOD from PCC log		
20(8)	Range Delay (NT2)		
20 (11)	Time from FOW to ROW (NT2)		
20 (11)	PCC Frame Offset		
20 (14)	Time from FOW to ROW (NT2)		
20 (14)	PCC Frame Offset		
20 (17)	Time from FOW to COM Burst (NT2)		
20 (17)	PCC Frame Offset		
21	Time from FOW to ROW (NT1)		
21	PCC Frame Offset		
22	Time from FOW to ROW (NT2)		
22	PCC Frame Offset		

TEST STEP	EXPECTED RESULT	OBSERVED RESULT	NOTES
23	Time from FOW to ROW (NT1)		
23	PCC Frame Offset		
24	NT1 request for ranging observed		Complete ROW data sheet.
24	Time from FOW to Range burst (NT1)		
24	PCC Frame Offset		
24	NT1 range delay		
25	Time from FOW to ROW (NT2)		
25	PCC Frame Offset		
26	NT2 request for ranging observed		
26	Time from FOW to Range burst (NT2)		
26	PCC Frame Offset		
26	NT2 range delay		
30	No Ranging Burst Sent		
32	Time from FOW to ROW		
32	PCC Frame Offset		
35	Time from FOW to ROW		
35	PCC Frame Offset		
38	Time from FOW to COM burst		
38	PCC Frame Offset		
39	Time from FOW to ROW		
39	PCC Frame Offset		
40	Time from FOW to ROW		
40	PCC Frame Offset		
41	Time from FOW to ROW		
41	PCC Frame Offset		

ROW:ASSIGN RANGING

FIELD	EXPECTED VALUE	RECEIVED	NOTES
Message Type	1		
Retry Flag	0		
Reserved Bits	0		

E-23 OVER-THE-AIR COMMUNICATIONS

The following checklist will be completed as the actions in the Test Step are performed.

Test Step	Expected Result	Observed Result	Notes
Unit Under Test:		**Date:**	
3	PCC FIREBERD synchronized		
4	NT1 FIREBERD synchronized		
5	Voice connectivity in both directions		
6	PCC correctly receives message		
7	NT1 correctly receives message		